July 1961

3 mills . . . 1 opening line

Custom dyeing boosts sales

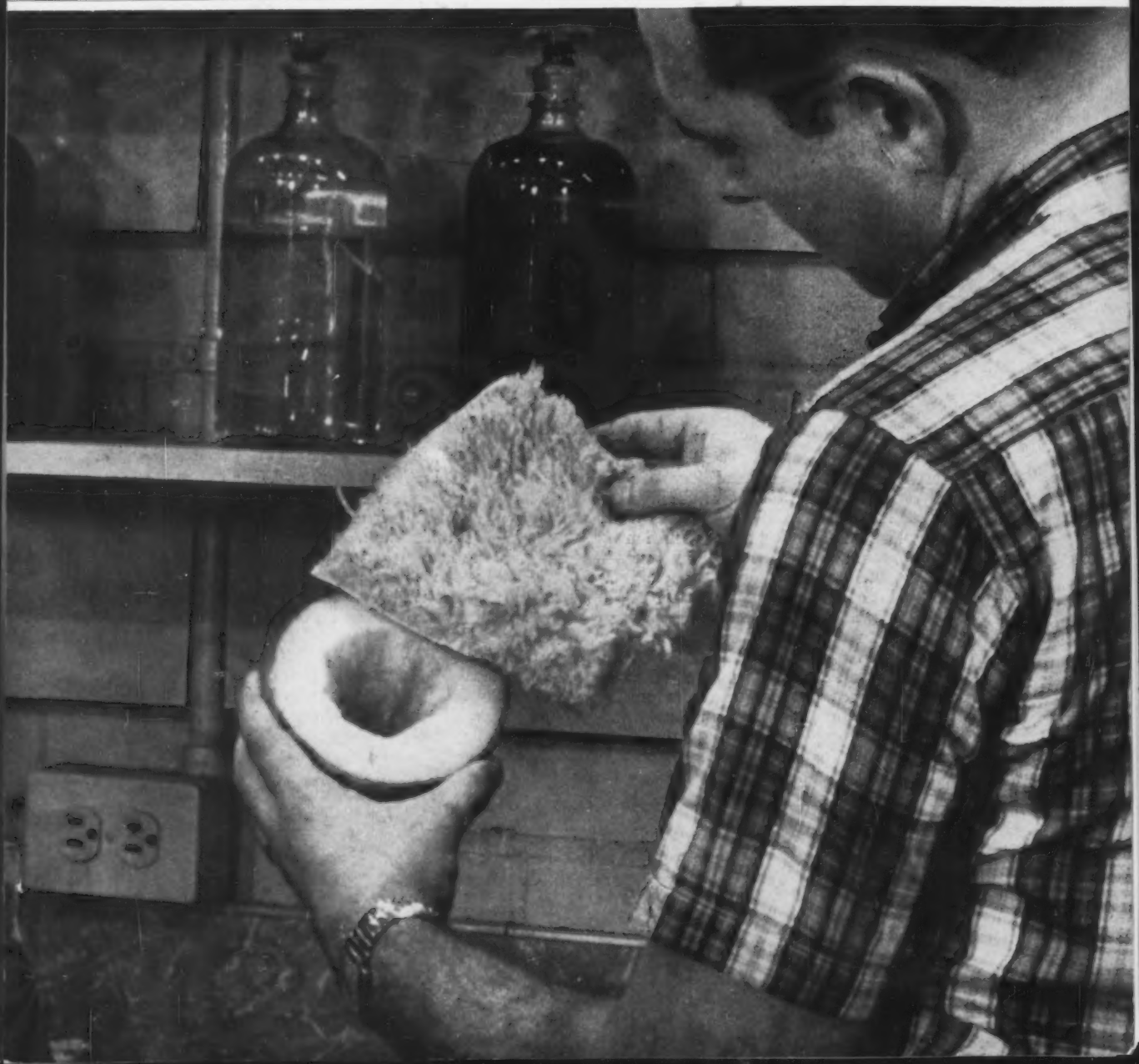
Ends down and wool grade

Who killed cotton quality?

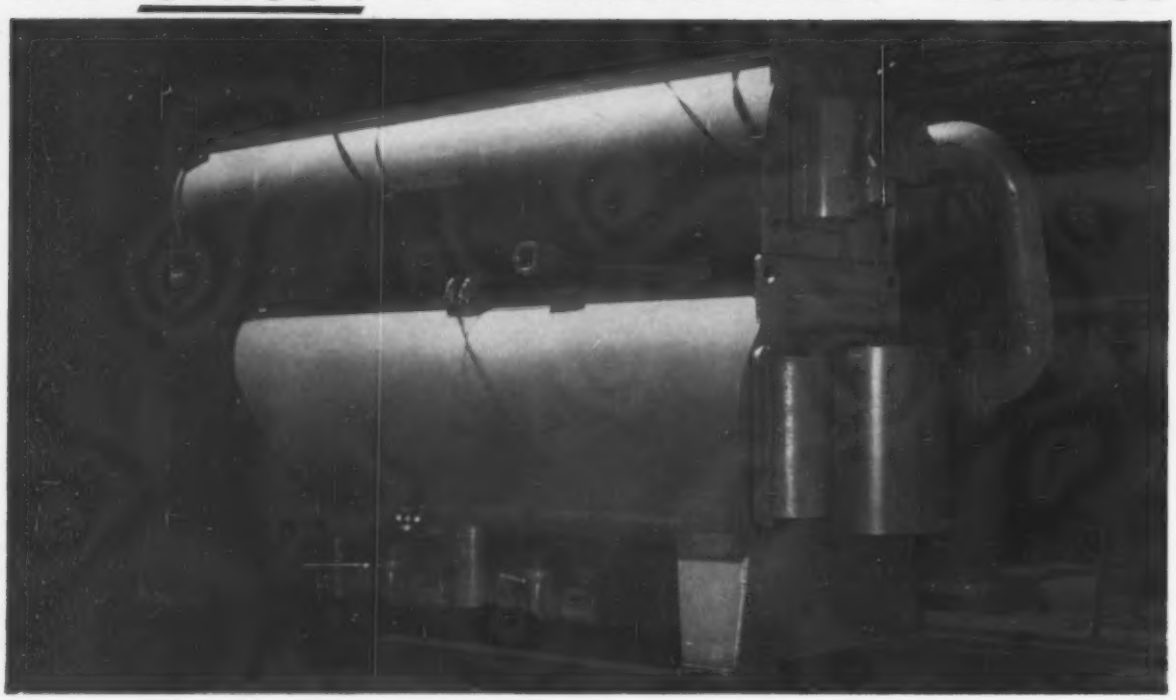
Complete contents on page 4

Textile Industries

a W. R. C. Smith publication formerly "Cotton" fifty cents per copy



Even boiler-cooled air conditioner faces the *Oldest* of maintenance troubles



Lithium bromide absorption systems need protection of their condenser cooling circuits

A popular development in air conditioners is the boiler-fed, water-cooled lithium bromide absorption system. It is economical and efficient, but since water plays a major part in its operation its maintenance problems are the same old ones—metal rusting, pitting, scaling and reducing efficiency to a point of complete breakdown.

Two ANCO products—Coolex and SR-2—can help you get and maintain top performance from your air conditioning system by neutralizing the effects of scale-forming and corrosive elements. Coolex and SR-2 keep rust and scale from forming and acting as insulators, from reducing heat transfer to an ineffective minimum. With the proper treatment program using these products the capacity of your system is maintained, operating costs are held to a minimum.

There are competent ANCO service representatives throughout the South who are experienced in all phases of water treatment and who will be glad to come by your office and give you the full story. Call or write to one of the offices listed below and we'll see that you get prompt attention. A simple maintenance program now may save you hundreds of dollars later, and there is no obligation on your part for talking with one of our men.

Write today and request an Anderson service engineer to make an analysis and recommendation on your plant's water treatment. There is no cost for this service.

SPECIALISTS IN MAKING WATER BEHAVE

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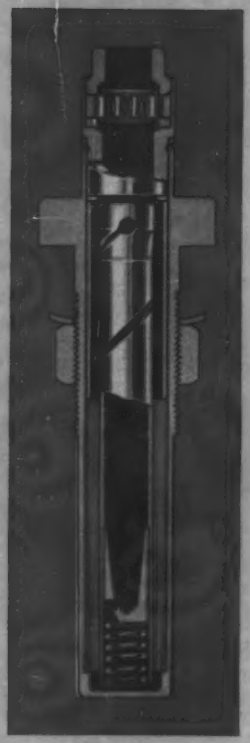

DA42

The Draper DA-4-2 Anti-friction Spindle is designed to run at higher speeds with heavier loads and lengthened oiling cycles. This spindle can be furnished to handle a full range of counts in both filling and warp yarns. The DA-4-2 Spindle features a one-piece steel base and a roller bearing bolster with coil spring dampening action. For the finest in spinning combinations, specify — Draper Bobbins, Rings and Spindles. For information, consult a Draper representative.

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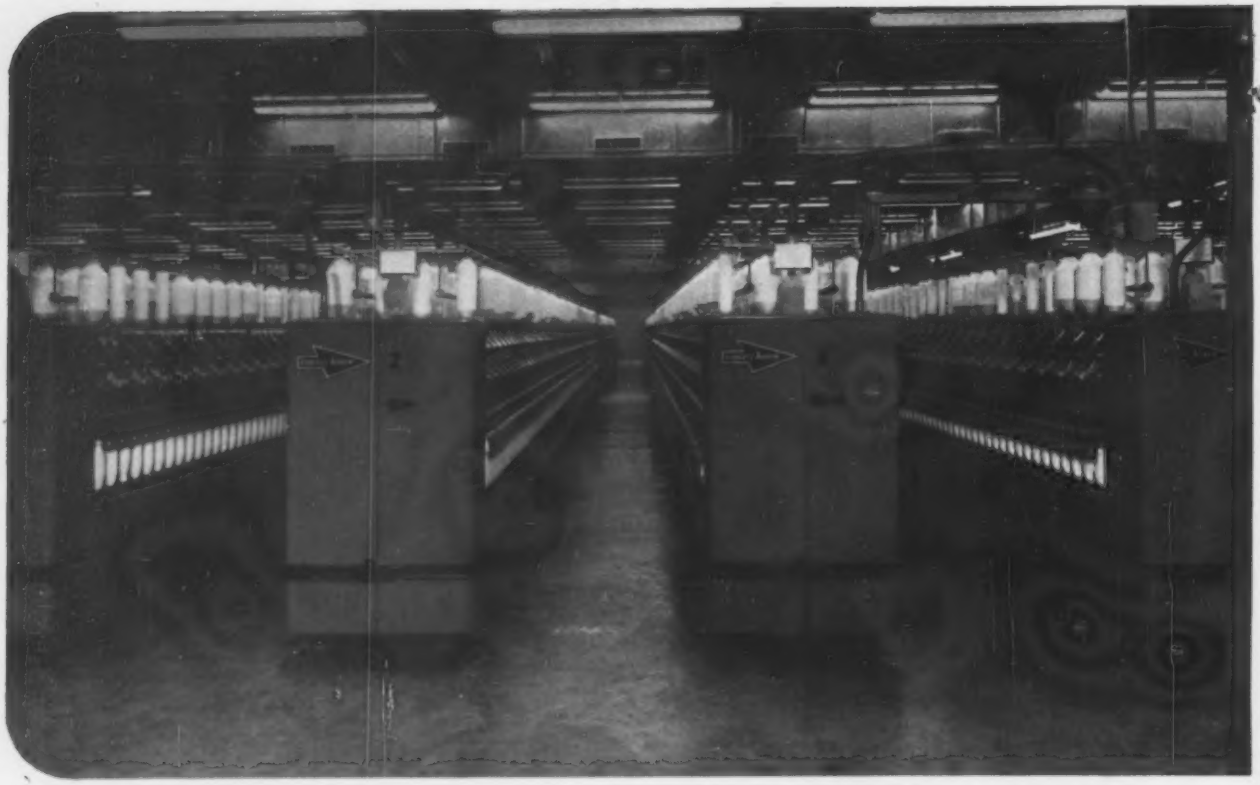
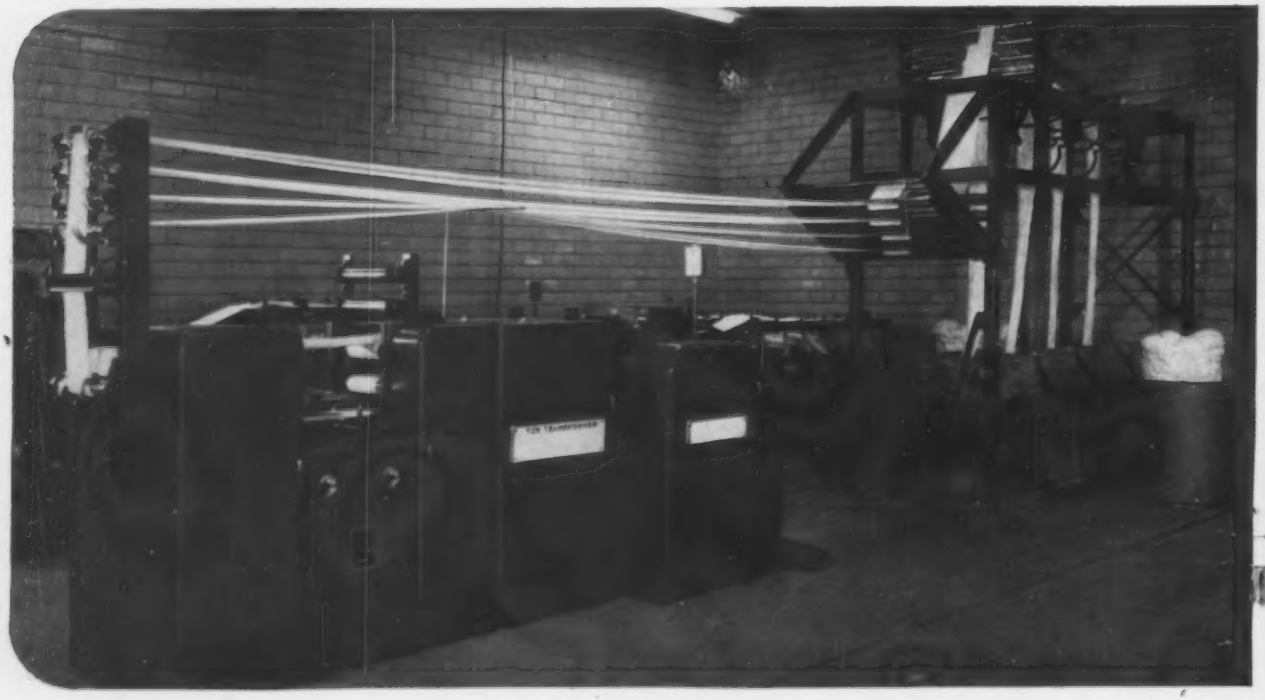


▲ **ROBERTS ARROW SPINNING** for both cotton system and long fiber system yarn spinning for natural and synthetic fibers and blends. High speed, all ball bearing, big package Arrow Spinning Frames in 25-inch or 36-inch width. Exceptional flexibility and simplicity of operation in the manufacture of improved quality yarns at reduced costs and modest initial investment. Choice of drafting systems, including FC Pendular Drafting and PermaSet Drafting.

ROBERTS TOW TRANSFORMER combines in one machine the two major tow processing operations – converting and high bulking, as well as ParaDrafting. Versatility and high productivity in transforming normal tops from normal tows, heat-stretched and high bulk tops from normal tows without second operation heat relaxing, and high bulk tops from two-component tows. Cuts 2½" to 8" lengths. Optional heat-stretching. 2 million denier infeed. ▼



For further information use Handy Return Card, Page 149

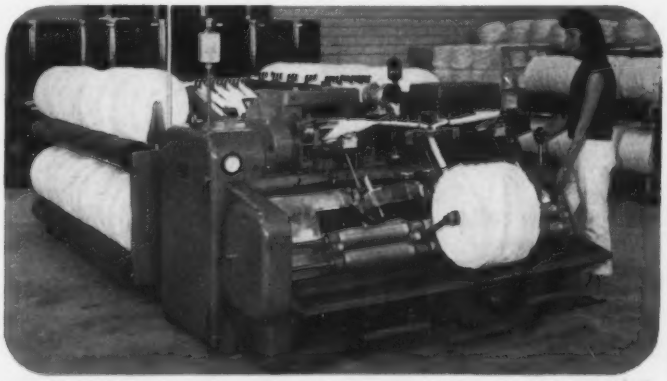
ROBERTS

Yarn Making Machinery

FOR COTTON, WORSTED, OR LONG FIBER SYSTEMS

ROBERTS ROVING FRAMES are ball bearing rebuilt and feature all-new heavy duty ball bearing Roberts Double Apron Drafting Systems for cotton, short staple or long fiber synthetics, worsted and blends. 10x5 and 12x7 packages. Provisions for double headed spools.

ROBERTS TWISTERS for plying yarns are completely ball bearing equipped and designed for high speed ring twisting operations. 25- or 36-inch frames. Up to 4-inch rings and 12-inch bobbins. Package weights 1¼ pounds on cotton, ¾ to 1 pound on worsted.



ROBERTS worsted system preparatory machines, which include ParaBlenders, ParaDrafters and AutoEveners, are rugged, high performance machines for pinning, parallelizing, drafting and blending worsted and synthetic fibers prior to roving and spinning, and in top making plants. AutoEvener automatically and instantaneously corrects delivered sliver weight to within plus or minus 1%.

Simplicity of design, rugged construction and high speed ball bearing operation are the hallmarks of all Roberts Company machinery. Roberts also supplies rebuilt spinning frames and modernization changeovers for mills' existing machinery.

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Textile Industries

The Textile Management

MANAGEMENT

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THIS MONTH'S COVER

Wunda Weve Carpet Co. will match "any color in the world"—including a ripe cantaloupe. Details, page 91.

IN TI NEXT MONTH

Man-made fibers

■ NEXT MONTH look for our fifth annual review of the man-made fibers, prepared by J. B. Goldberg and the staff of TEXTILE INDUSTRIES. A highlight of the review will be an up-to-date revision of the pull-out chart, "Properties and Uses of the Man-Made Fibers," and "Trademarks of Man-Made Fibers and Where to Get Them."

Among the subjects covered in articles written especially for this review will be multi-fiber blends, spandex yarns, woven stretch fabrics, wash-and-wear rayons, foreign fibers and yarns, processing Dacron-wool blends, and printing glass fabrics.

Plus . . .

■ CONTROL of stream pollution is becoming more and more important, both through the force of public opinion and through state and national legislation (such as the Kerr pollution control bill). One important approach to solving the problem of reducing stream pollution by textile mills is through the substitution of low-BOD chemicals for some of the high-BOD chemicals now used by the industry. TEXTILE INDUSTRIES for August will explore this aproach in two companion articles, one for the woolen mill and one for the cotton finishing plant.

The sixth article in Norbert L. Enrick's series, "Modern Textile Management," will cover the preparation and use of sales anticipation curves as an aid in textile management's coordination of sales, production schedules, and inventory build-ups.

new, time-saving splice
for specialty fabrics...

thinner and stronger with
TEXTILE TAPES FROM 3M

No more sewing of seams to splice glass cloth or other low-pick fabrics. With this new 3M-Matic Textile Splicing Process the operator simply lays a strip of "SCOTCH-WELD" Bonding Tape between the two ends, presses a button to effect the splice. It's done in a matter of seconds, and, since every splice is even, wrinkle-free and tight, waste is greatly reduced. For more information, contact your 3M Representative or nearest "SCOTCH" BRAND Tape Distributor . . . or write: 3M Co., 900 Bush Avenue, St. Paul 6, Minnesota, Department IBO-71.

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...WHERE RESEARCH IS THE KEY TO TOMORROW

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"SCOTCH" & "SCOTCH-WELD" ARE REG. TRADEMARKS OF 3M CO., ST. PAUL 6, MINN.

SHORTS & REMNANTS

Foot Care for Textile Men

Elsewhere in this issue we report on the sad state of American feet, as it was told to us by the National Foot Health Council. Well, here we'd like to pass along this advice to foot-weary worthies in the textile business: Placing your feet on your desk causes the blood to run away from them, relieving the discomfort of tired arches.

However, some bosses take this pose unkindly, and may even speak harshly to you. To avoid this, and still get the healthful benefits of feet-on-desk sitting, simply open a copy of TEXTILE INDUSTRIES and read it. A copy of *Playboy* will not work.

Your boss will then smile very largely at you and compliment you for trying to find ways to make the mills run better.

A recent opinion survey made among employees showed that they are *all* smarter than their bosses. This is one way to show your superiority subtly.

In the photo, Joe Sliver demonstrates the correct position. Joe insists that he prefers TI to *Playboy*.

Incidentally, we hadn't seen Joe for some time until we went to make this picture. He certainly doesn't look his 95 years.

TI Gets Good Grade

"Thank you very much for your speedy attention to our request for

For further information use Handy Return Card, Page 149

information on the point system of grading fabrics. The two articles which you sent have proven most useful to us."

M. S. KOROL
V-P, Bates Mfg. Co.
Augusta, Maine

►We are indebted to the *Wall Street Journal* for this bit of incidental information: Red carpets for special occasions are loaned by Chemstrand Corp., which makes Acrilan fiber in the long carpets. Users of the free service have been rolling out the carpets for such things as store openings and to impress big customers when they come to town.

Terry from Italy

"Last week was 'Italy Week' in Manchester; all the large stores had big displays of 'Made in Italy' merchandise. I took a busman's holiday to have a look at the terry towels that were shown.

"The colors were beautiful—clear white bleaching—very soft but full hand—lovely designs—many attractive novelty cross borders and stripes in non-terry weaves mixed into the terry fabrics.

"I analyzed two particularly attractive patterns: The Jacquard end cross border in one—a really attractive effect—I found to be woven width for length in the loom. The cross border was woven by combining colored figuring warp with the bleached ground. No terry loops were in these borders.

"The other had nine panels, each 2" wide, of colored terry loops separating eight non-terry 1 3/16" Jacquard figured extra warp colored threads on the bleached ground weave. No terry loops in these stripes.

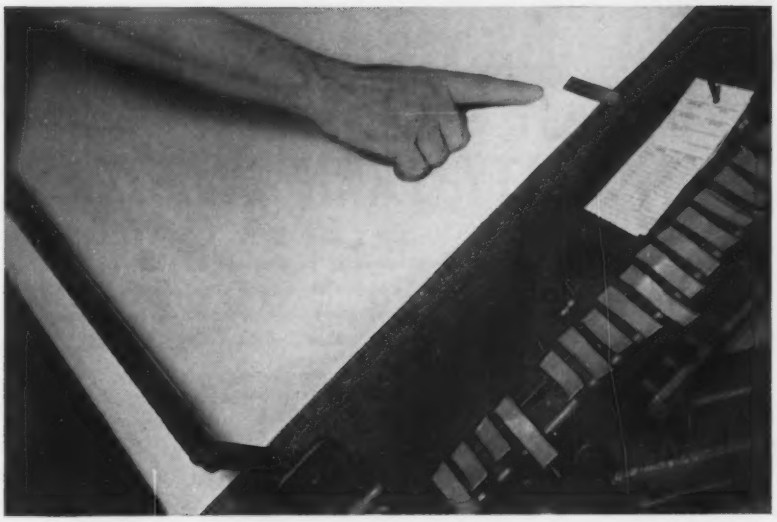
"In both cases an extra third beam was required to carry these colored figuring threads."

T. HARGREAVES
Blackpool, England

Corncob Bobbins

Corncobs have many uses—furfural is made from them, for instance (but what is made from furfural?). Personally, we had never heard of their being used for bobbins, but the Old Slater Mill Museum at Pawtucket, R. I., says they were.

The Museum has a display of rolls, spindles, and what-not from Samuel Slater's original spinning frame, built in the 1790's. In the display are some corncobs, with lengths of obviously ancient yarn wound on the cobs. The Museum's bulletin, *The Spinner*, theorizes that at some time in the more than a century and a quarter



quickly flag flaws
wherever they are found

with brightly colored
TEXTILE TAPES FROM 3M

The fastest, surest way to mark defects in material in the mill or in the sewing room is with colorful tabs of "SCOTCH" BRAND Paper-Backed Tape. And it's mighty practical, too, because when the defect is repaired, the tape comes off without a trace. Another feature: the tape can be printed with inspector's number, or can be written on with pencil or crayon. For more information, contact your 3M Representative or nearest "SCOTCH" BRAND Tape Distributor . . . or write: 3M Co., 900 Bush Avenue, St. Paul 6, Minnesota, Department IBO-71.

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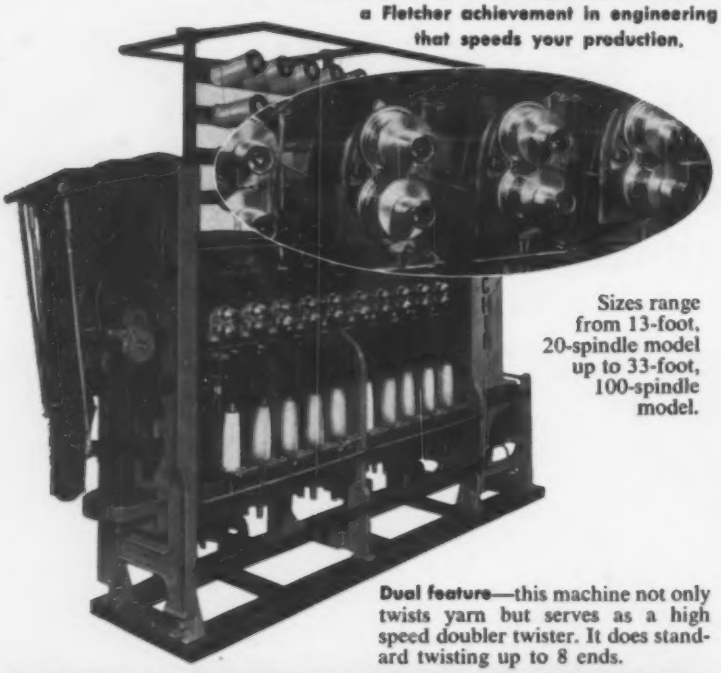
. . . WHERE RESEARCH IS THE KEY TO TOMORROW
"SCOTCH" IS A REGISTERED TRADEMARK OF 3M CO., ST. PAUL 6, MINN.

NEW from FLETCHER

HIGHEST SPEED NOVELTY YARN TWISTER EVER MADE

This Novelty Yarn Twister, which operates at a speed of 5,000 to 9,000 RPM, depending on the type of yarn used, is a Fletcher achievement in engineering that speeds your production.



Sizes range from 13-foot, 20-spindle model up to 33-foot, 100-spindle model.

Dual feature—this machine not only twists yarn but serves as a high speed doubler twister. It does standard twisting up to 8 ends.

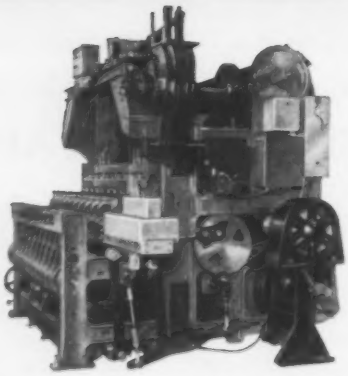
TRY BEFORE YOU BUY with 3-month trial rental plan

Get proof before you pay by evaluating these machines in your own plant. They are available for delivery, completely assembled. See them in operation in the Fletcher Industries Showrooms in Cheltenham, (Philadelphia) Pa.

NYLON AUTOMOBILE SEAT BELT LOOM

This loom is made specifically to meet the fast-growing demand and to overcome the shortage of equipment for the manufacture of automobile seat belts.

Fully equipped and erected $5,000



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FLETCHER SOUTHERN
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FLETCHER INDUSTRIES
STATESVILLE, N. C.

SHORTS & REMNANTS

(from page 7)

that spinning was carried on in the Old Slater Mill, an operative must have drawn on his "Yankee ingenuity" to press the corncobs into use for winding yarn.

PS—Furfural is a raw material used in the manufacture of nylon, acetate, and synthetic resins, we are told.

More on Silk

"In the May issue of TEXTILE INDUSTRIES I noticed a small article [page 10] 'Silk for Fun and Profit.' . . . there was at one time, as I gather from talking to 'old timers,' a thriving silk industry at Tallulah Falls, Ga. The old foundations of the huge building are still there, along with several graves. The structure was situated on the old road going from Tallulah Falls to Toccoa, Ga. This road is still called the 'Old Silk Mill Road,' and can be traveled by Jeep."

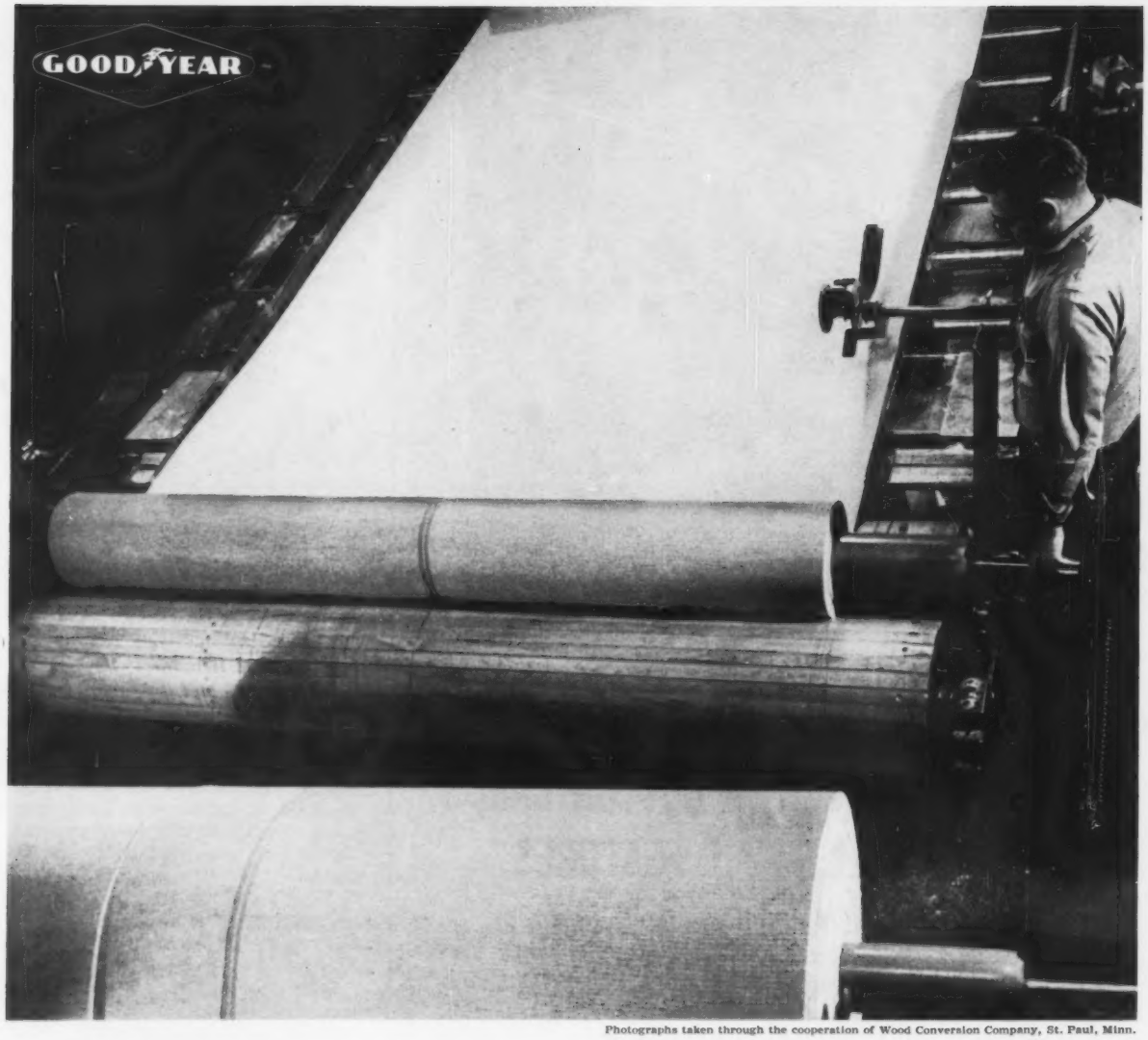
CHARLES HARDMAN
Chicopee Mfg. Corp.
Cornelia, Georgia

Senior Leprechaun

Speaking of corncobs (as we were a few lines ago) reminded us of leprechauns. And that in turn reminded us that we learned only the other day that not all leprechauns come from Ireland—they have them in Brazil, too. Our source for this is TI's **John Cook,** who is an authority on both Brazil and leprechauns. Here is what one looks like:

John assures us that this Brazilian leprechaun is not eating a banana; he is trying to find a light for his pipe.

Continued on page 10



Photographs taken through the cooperation of Wood Conversion Company, St. Paul, Minn.

Post another "net" gain for CHEMIGUM LATEX!

A more durable spring insulator, or pad backing, was what this cellulose cushioning manufacturer was looking for.

He achieved it, easily and economically, by rubberizing the high-quality cotton net back of the high-quality cushioning with CHEMIGUM LATEX. This not only improved its strength and wear-resistance substantially, but provided a nonskid surface which also is important to cushioning durability. CHEMIGUM LATEX was chosen for its superiority in these properties plus its ease of processing, particularly in the calendering operation.

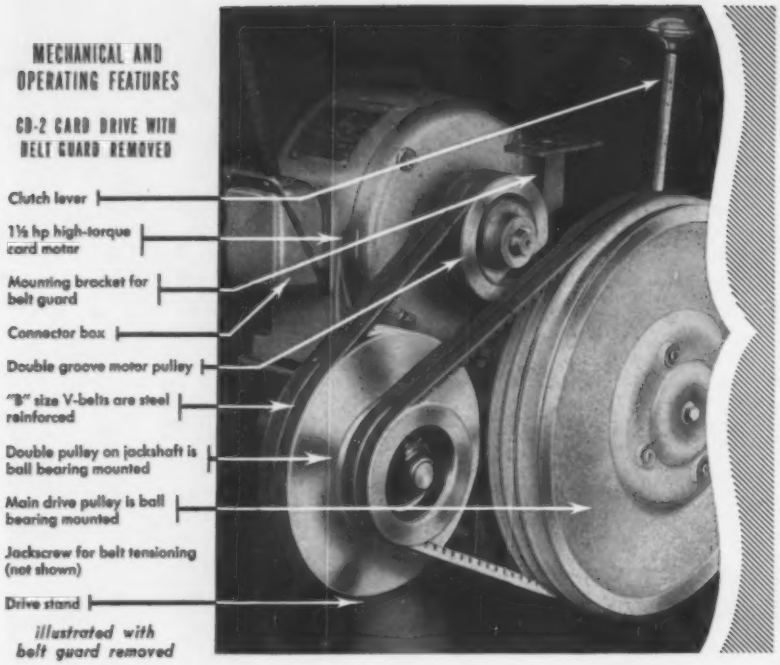
What can your product gain from CHEMIGUM LATEX? Find out by writing for details, including the latest *Tech Book Bulletins,* to Goodyear, Chemical Division, Dept. G-9439, Akron 16, Ohio.

Lots of good things come from

GOODYEAR

CHEMICAL DIVISION

Chemigum—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio


MECHANICAL AND OPERATING FEATURES
CD-2 CARD DRIVE WITH BELT GUARD REMOVED
Clutch lever
1½ hp high-torque card motor
Mounting bracket for belt guard
Connector box
Double groove motor pulley
"B" size V-belts are steel reinforced
Double pulley on jackshaft is ball bearing mounted
Main drive pulley is ball bearing mounted
Jackscrew for belt tensioning (not shown)
Drive stand
illustrated with belt guard removed

ONLY SOUTHERN STATES TYPE CD-2 INDIVIDUAL DRIVE FOR COTTON CARDS OFFERS ALL THESE FEATURES

The CD-2 Individual Card Drive is the simplest, safest, and most efficient drive on the market today. It combines into one unit the features most wanted by mill men when specifying a drive for cotton cards. Here is why:

Finger-Tip Control: No changes in operating procedure. The unit is controlled by a simple clutch lever in both starting and hand stripping.

Full Speed in Seconds: A 1½ hp high torque card motor smoothly brings the card into full operation, seconds after the clutch is engaged.

Safety Engineered: All belts and moving parts are covered. Starting and idling is accomplished by the clutch lever. Stripping is done in the conventional manner.

Rugged Construction: The entire unit is built for heavy-duty service: steel main stand; cast iron jackshaft bracket and main pulley; cast aluminum cover; ball bearing construction throughout.

Easy Installation: Fits any cotton card. Minimum number of holes to drill in frame. Drive pulley, collar and clutch are preassembled and slip on shaft using existing keyway.

See your Southern States representative for all the facts, or you may write direct for Bulletin 301-a.

SOUTHERN STATES
EQUIPMENT CORP.
HAMPTON, GEORGIA

SHORTS & REMNANTS

(from page 8)

If one of our Israeli readers has a picture of a leprecohen we'll be glad to print that, too.

► We hear that one appliance manufacturer has put a "wash-and-wear" setting on his irons.

Gear Testing

"We are trying to obtain a reprint of an article which had to do with testing the run-out on spur gears. Can you help us?"

J. H. McDOWELL, JR.
PA, Dixie Mercerizing Co.
Chattanooga, Tennessee

"Do You Check Gear Run-Out Too?" by Herman Granberry of West Point Mfg. Co., is the article in question. It appeared in our October, 1959, issue, and we have a few reprints left.

Space Dyeing

"We noted in one of your recent issues [May, 1961, page 73] an article on space dyeing by Fred Whitaker and the inference that this was a new art. We wish to advise that we have been doing space dyeing by our Colorplus process and by many other processes for on to 40 years now. We believe that we are the leaders in the field of space dyeing. But even space dyeing is not new with us having been done thousands of years ago in various forms and fashions."

E. J. EPSTEIN
Secretary & Superintendent
National Rayon Dyeing Co.
Newark, New Jersey

Sorry if there was any implication that space dyeing was a new art; we've printed occasional articles on it for years. And did you see the article "Multicolor Yarn Dyeing Made Easy," also in our May issue?

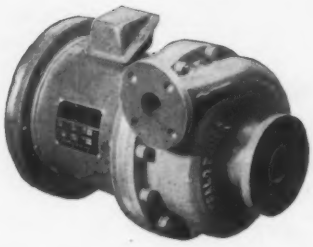
Shovels and Keys

This has been a slow month for first-shovelful pictures, but here's a key-to-the-city picture:

That's **R. D. Warwick**, manager of the Statesville, N. C., Chamber of Commerce; **Edward T. Taws, Jr.,**

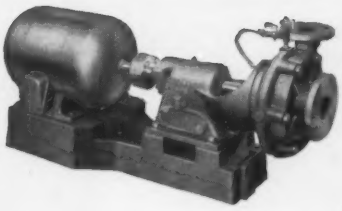
For further information use Handy Return Card, Page 149

DON'T LET CORROSIVES CREATE A PUMPING PROBLEM



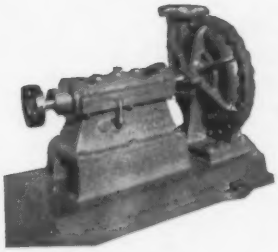
HERMETIC PUMPS

. . . a new design for use where leakage would be costly or dangerous. They will not leak! Wear compensating bearings take up thrust loadings. Available in a variety of materials of construction. For pressures up to 400 psi.



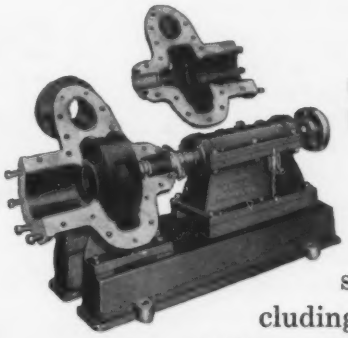
SPECIAL ALLOY PUMPS

. . . of single-suction ball bearing type, capable of handling your toughest liquid moving job. Materials of construction include Hastelloy B or C, nickel, bronze, lead, stainless, just about any material that can be cast and machined. Capacities to 1100 gpm, head to 360'.



HARD LEAD PUMPS

. . . with vertical split housing. All components exposed to liquid are of hard lead. Typical 'Buffalo' heavy-duty construction throughout. Built in capacities to 600 gpm, heads to 120'. Details available on request.



RUBBER LINED PUMPS

. . . offered with various types of rubber from soft to hard, including neoprene with high graphite content. Diagonal split housing for ease of maintenance. Piping need not be removed for inspection of rotating parts. Single and double suction models.

For more detailed information on 'Buffalo' pumps for industry, contact your resident Buffalo Engineering Representative or write direct.

"Buffalo" PUMPS

BUFFALO PUMPS DIVISION

BUFFALO FORGE COMPANY

Buffalo, New York

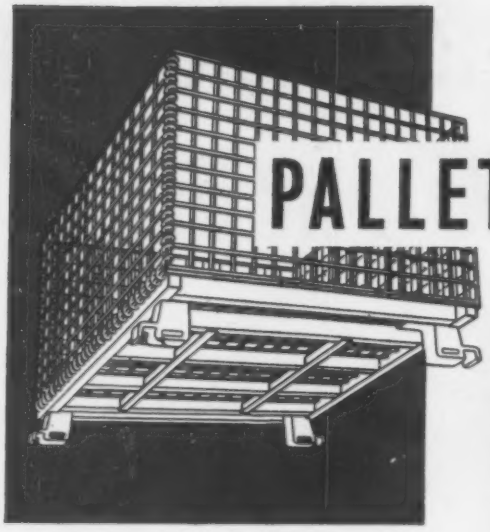
Canada Pumps Ltd., Kitchener, Ontario

'Buffalo' Air Handling Equipment to move, heat, cool, dehumidify and clean air and other gases.

'Buffalo' Centrifugal Pumps to handle most liquids and slurries under a variety of conditions.

'Buffalo' Machine Tools to drill, punch, shear, bend, slit, notch and cope for production or plant maintenance.

Squier Machinery to process sugar cane, coffee and rice. Special processing machinery for chemicals.



USP
PALLETAINERS®

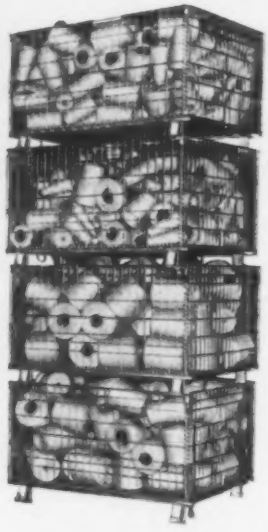
engineered containers for the..
TEXTILE
INDUSTRY

USP Palletainers are readily available in a broad range of standardized sizes and types to meet practically every Textile Industry requirement or application.

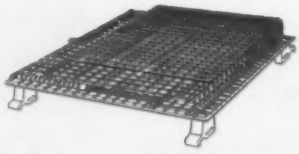
And, Textile Palletainers offer the obvious advantages of modern container, unit handling methods, the safety of sturdy steel wire mesh under standard or special protective finishes—plus the ease and simplicity of space-saving storage and rapid movement of unitized loads—more economically.

Already . . . Palletainers have revolutionized former handling methods for in-work storage of cones, spools, spindles, quiller bobins—even delicate yarns in processing phases.

Why wait? Simply phone, wire or write today and you can try Palletainers in your own plant—and see for yourself how they streamline processing, storage, interplant transport and shipment.



Textile Palletainers offer safer, higher stacking. Save more valuable floor space. Contents always visible.



Palletainers "Flat-Fold" features save storage space—lowers return freight costs.

Palletainers with gates offer complete content accessibility even when stacked. Stacking saves valuable floor space.

Delicate yarns in plastic covers in Palletainers may be stored indefinitely—always visible, accessible, safe and clean. A wide range of Palletainer snap-in liners are available.

SHORTS & REMNANTS

(from page 10)

vice-president of Fletcher Industries; and **J. Gardner Bagnal,** mayor of Statesville and secretary-treasurer of Statesville Narrow Fabrics Co. They were foregathered to celebrate Fletcher's first anniversary in Statesville.

Reprint Requests

"Technique of Jacquard Designing" (June, 1958)—**Paul C. Beatty,** gen. mgr., Halifax Cotton Mills, Inc., South Boston, Va.

"Blends Get Business" (April, 1961)—**Edmond A. Ambrogi,** Leon-Ferenback, Inc., NYC.

"Creaseproofing Agents for Wash-and-Wear Finishing" (October, 1959)—**L. V. Mills,** PA, Roanoke Mills, Inc., Roanoke, Va.; **Norman C. Bourget,** PA, Guilford Woolen Mills, Inc., Guilford, Me.; **Albert R. Davidson,** V-P, Exeter Mfg. Co., Exeter, N. H.; **M. L. Harrison,** mgr., knitting div., Beaunit Mills, Inc., Lowell, N. C.; **Allen Leibowitz,** plant supt., Indian Orchard Finishing Co., Indian Orchard, Mass.; **J. A. Conner,** V-P, Hyde Park Mills, Inc., Covington, Tenn.; **Russell B. Coleman,** pres., National Dyeing & Finishing Corp., Culver City, Calif.; **F. Diedrich,** supt., bleachery, Cluett, Peabody & Co., Inc., Waterford, N. Y.; **L. A. Morin,** supt., Belknap-Sulloway Mills Corp., Laconia, N. H.; **L. M. Flowers,** plant mgr., Beaunit Mills, Inc., Statesville, N. C.; **Jacob Serbin,** pres., Narricot Corp., Philadelphia, Pa.; **Fay L. Luzader,** Western Dye House, Inc., Los Angeles, Calif.; **Raymond Prunier,** dye. & fin. suprvr., Ansonia Mills, Inc., East Taunton, Mass.; and **Robert H. Blum,** Bluco Textile Printers, Inc., Brooklyn, N. Y.

"How Direct Chlorination Cuts Bleaching Costs" (August 1959)—**J. H. Zechman,** supt., Danville Knitting Mills, Inc., Danville, Va.; and **W. P. Rodgers,** sec., Randolph Mills, Inc., Franklinville, N. C.

"Costing the APO-THPC Finish" (April, 1961)—**H. J. Krantz,** pres., Reliance Dyeing & Finishing Corp., Covington, Ky.; and **H. J. Franklyn,** V-P, Lynrus Finishing Co., Inc., Poughkeepsie, N. Y.

"Fabric Defects in Wool Finishing" (December, 1957; January and February, 1958)—**Andrew F. Blackburn,** quality dir., Appleton Woolen Mills, Appleton, Wis.

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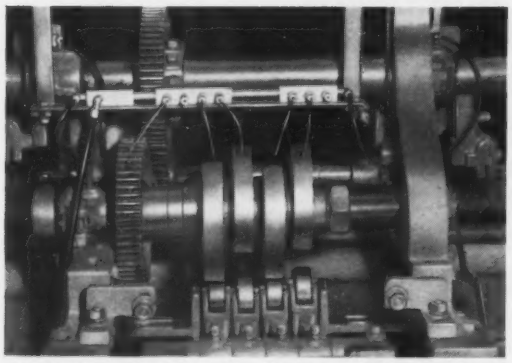
Draper Looms get full-time, under-warp lubrication

with ALEMITE CENTRALIZED LUBRICATION SYSTEM



Alemite Accumite System on a Draper Loom. Bearings, cams and gears are kept properly lubricated at all times... with measured amounts of lubricant.

Accurate, positive delivery of lubricant to hard-to-reach "under-warp" points of application – *while the loom remains in full operation* – is offered as optional, factory-installed equipment by Draper Corporation, the world's largest manufacturer of automatic looms.

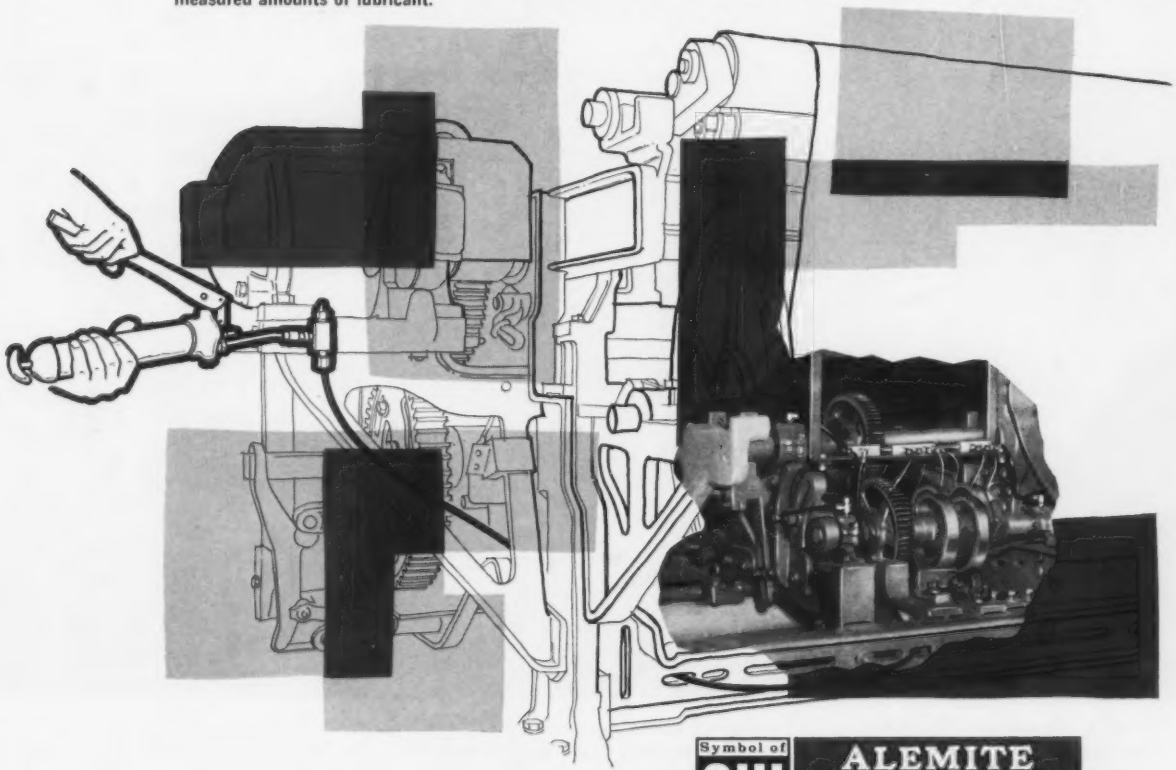
Alemite's Accumite Centralized Lubrication, in a simple harness, can be quickly and easily installed on looms already in the field to provide measured quantities of lubricant to shedding and picking cams, gears and important under-warp bearings.

From 12 to 34 loom bearings and gears can be lubricated from one conveniently located lubrication point. The system can be manually operated, or automated from a central pumping unit–electrically timed.

Centralized Lubrication to these vital bearings eliminates excess drippage and seepage onto the floor – there's no wasted lubricant. It saves time by reducing 12 or more gun applications to one.

The System has been tried and proven on hundreds of Draper looms. When ordering new looms, specify Alemite Accumite Centralized Lubrication Systems. And for further economy of operation and reduced costs, equip your present looms with an Alemite System!

Send for complete additional information... or contact the Alemite representative in your area.



Symbol of SW Excellence

ALEMITE DIVISION
STEWART-WARNER CORPORATION

In Canada: Stewart-Warner Corporation of Canada Ltd., Belleville, Ontario

Dept. O-71, 1850 Diversey Parkway, Chicago 14, Ill.

Spin top-quality yarn with Armstrong Accotex roll covers and aprons

Smoothness . . . uniformity . . . strength: these are the marks of quality yarn. And they depend, to a large extent, on the performance of your spinning cots and aprons.

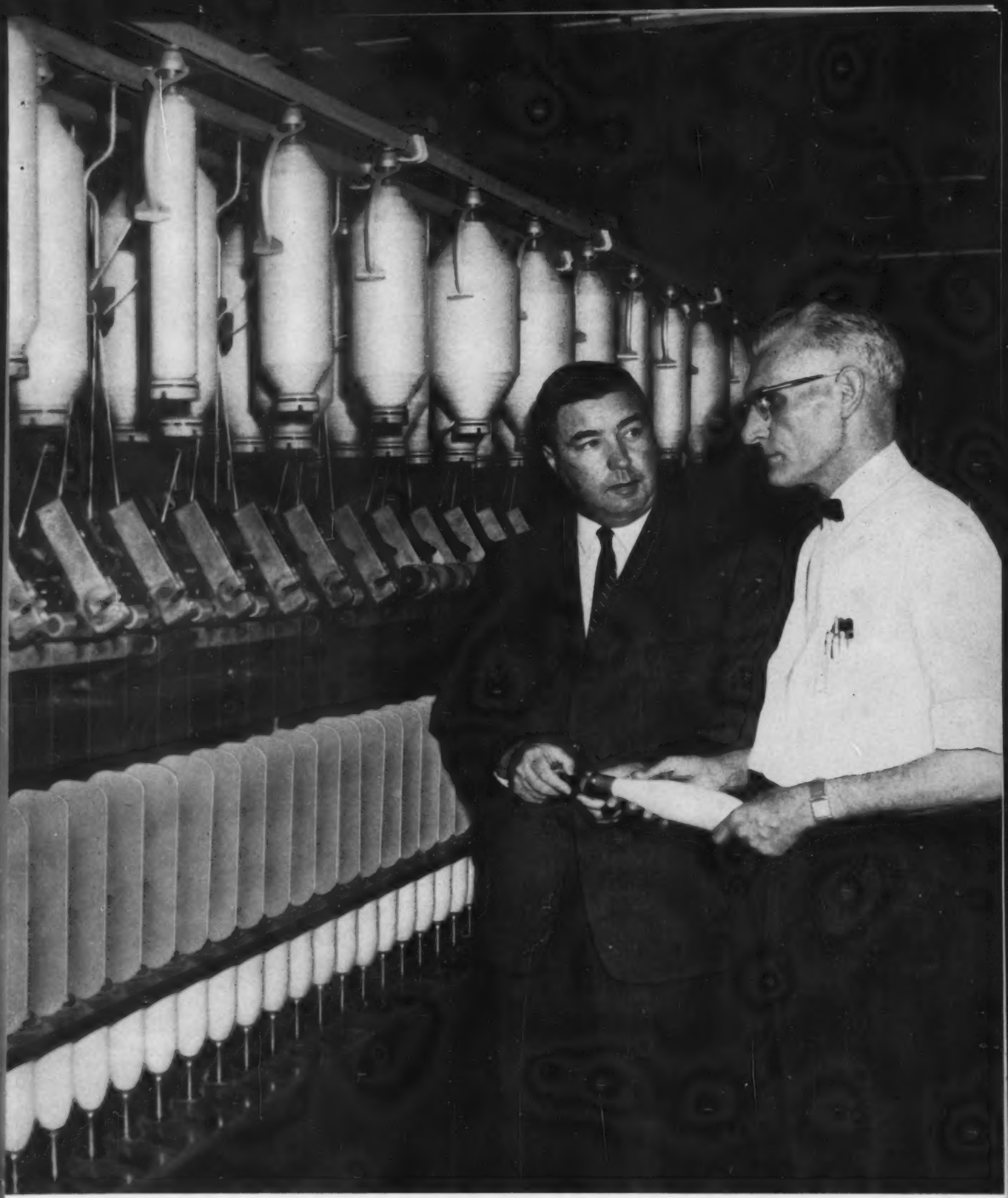
To keep yarn quality high, hundreds of mill men specify Armstrong Accotex cots and aprons. They know that Accotex products provide the smooth drafting action and superior yarn control so necessary to production of quality yarn.

And these men also know that their Armstrong representative can make dependable suggestions on practically any roll covering and apron problem. Armstrong Cork Company, Industrial Division, 6407 Ivy Street, Lancaster, Pennsylvania.

Taylor Weaver and Archie Cox, Overseer of Carding, checking the Accotex J-490 covers used on this drawing frame.

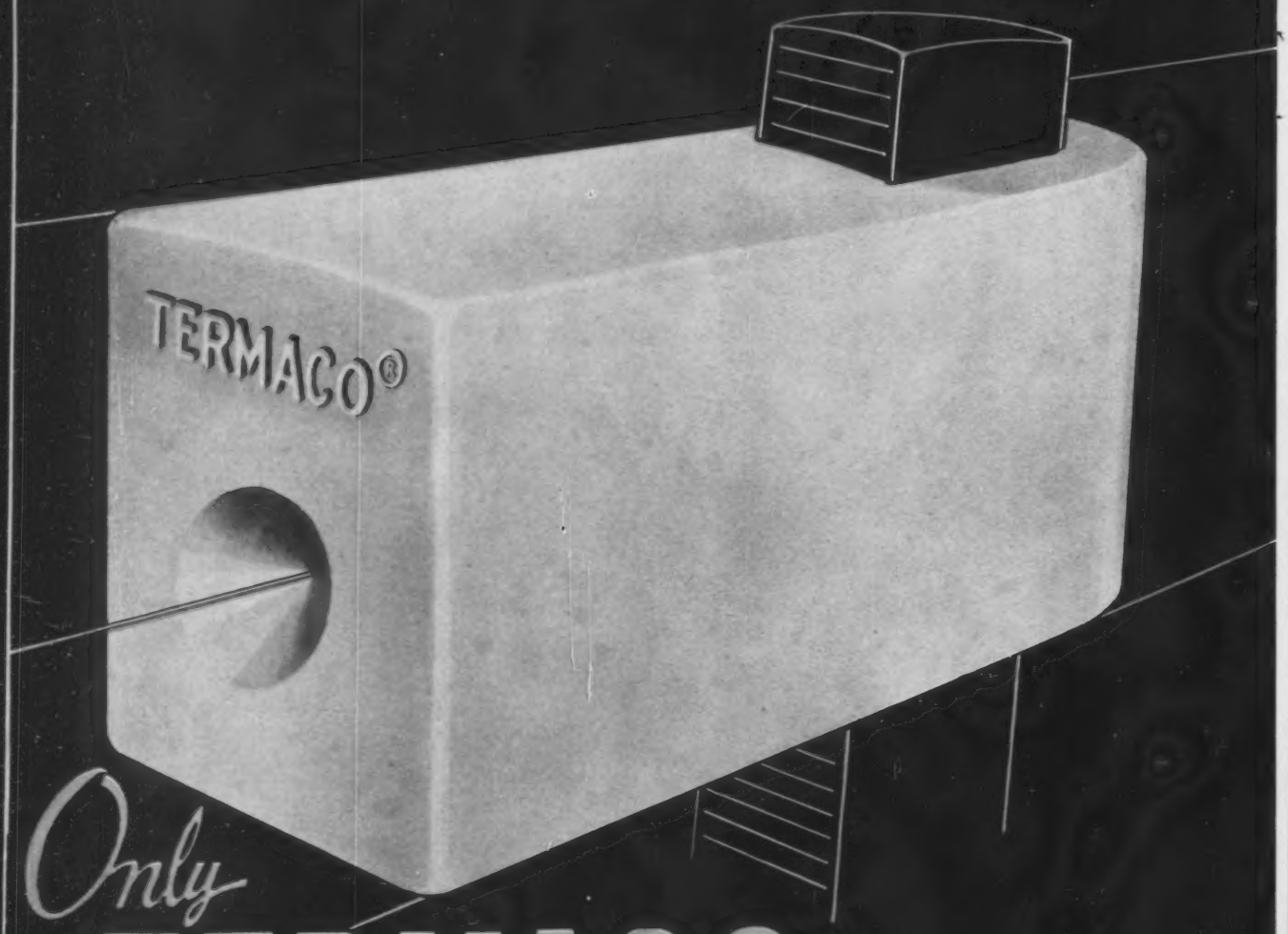
Jack Radford is in charge of the roll shop. Here he discusses operation of this Armstrong Model "J" buffing machine with Weaver.

L. T. Embler, Superintendent of this Abney Mills plant, discusses spinning characteristics of a new Accotex roll covering with Weaver.



H. C. Thrasher, right, Overseer of Spinning at the Abney Mills plant in Anderson, South Carolina, discusses performance of this new spinning frame with Armstrong representative Taylor H. Weaver. Frame is equipped with Accotex NO-728 front line cots, NC-729 cots on the back line, and NO-7075 aprons.

Armstrong ACCOTEX COTS AND APRONS



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TERMACO

LIGHT COLORED PICKERS

have a firmly established, production proved record of

LOWEST COST PER LOOM PER YEAR

MADE BY DENMAN RUBBER MFG. CO., WARREN, OHIO

THE TERRELL MACHINE CO., INC.

CHARLOTTE, N. C.

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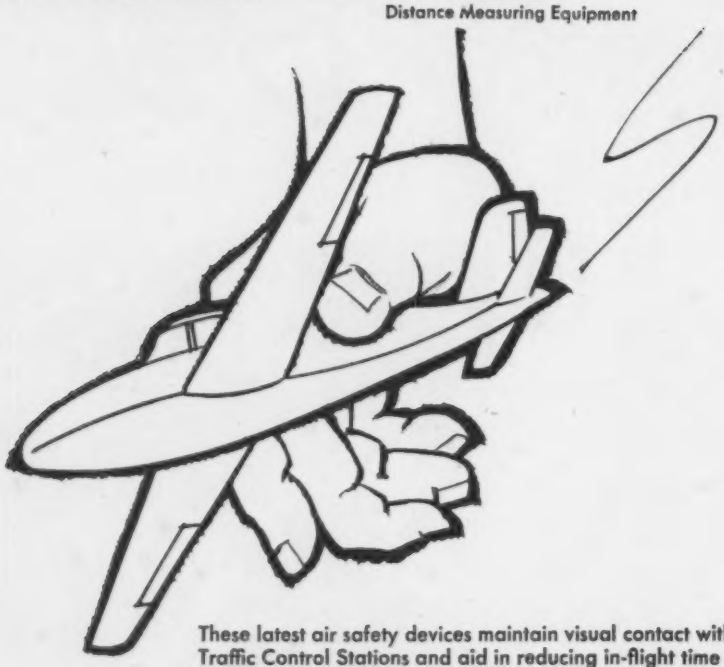
PRECISE & POSITIVE IDENTIFICATION TRANSPONDER & D M E

Distance Measuring Equipment



These latest air safety devices maintain visual contact with FAA Traffic Control Stations and aid in reducing in-flight time under all flight conditions.

AIR TRAFFIC CONTROL TRANSPONDER
provides aircraft with precise and positive radar control from the ground

DISTANCE MEASURING EQUIPMENT
shows exact distance from any selected navigational station

SOUTHERN AIRWAYS COMPANY

Radio & Electronics Department

ATLANTA AIRPORT ATLANTA, GEORGIA

For Information & Estimates: W. M. LENTZ, Mgr. POPLAR 7-1556

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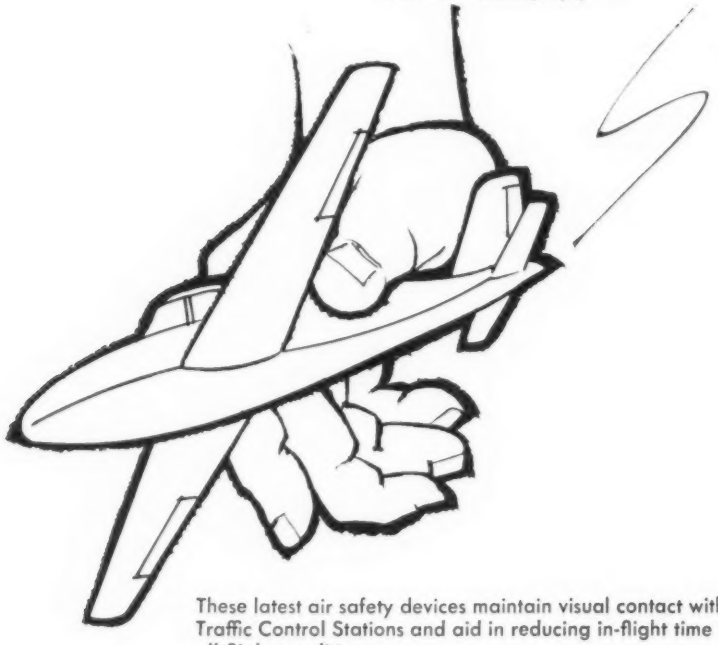

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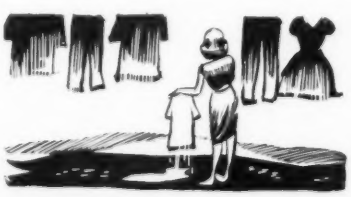

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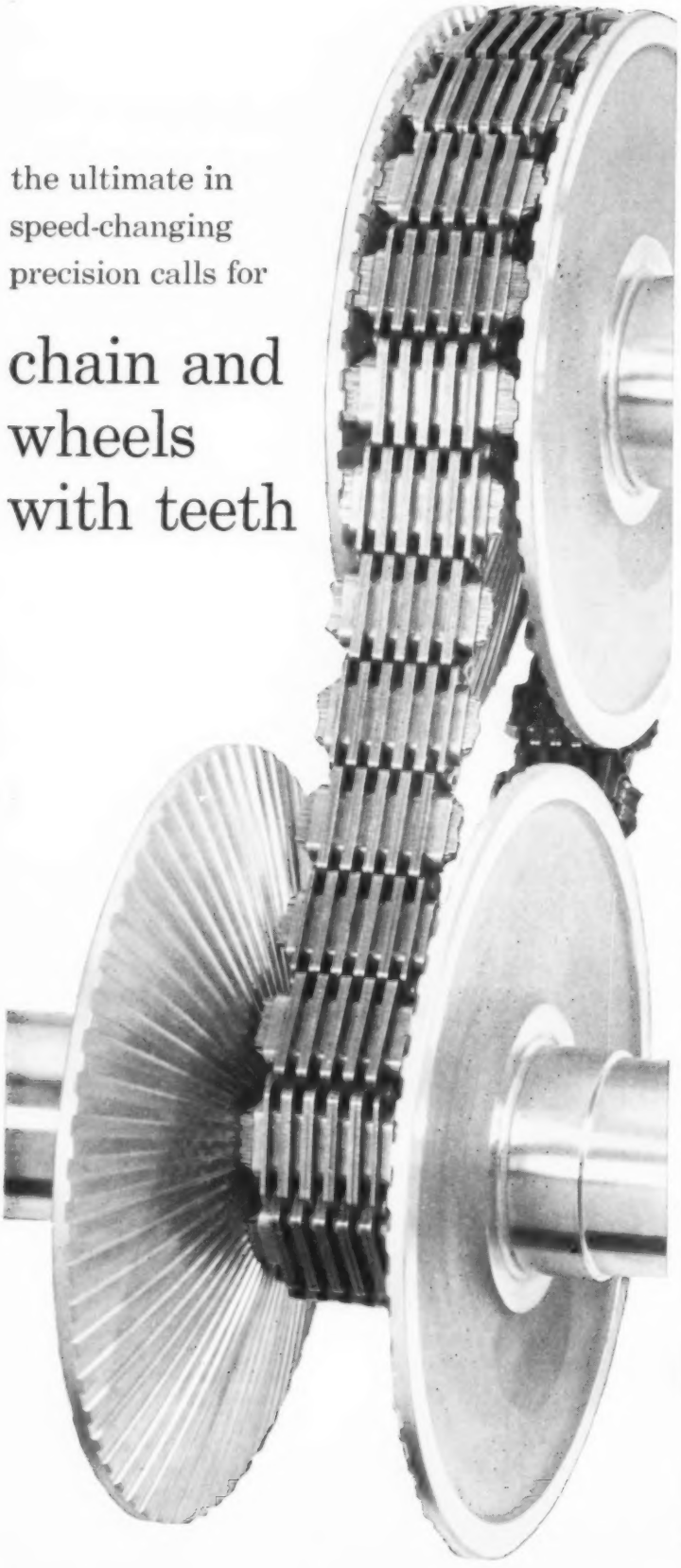
the ultimate in speed-changing precision calls for

chain and wheels with teeth



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Unusual speed control accuracy results from P.I.V.'s unique design featuring *wheels and chain with teeth.* The two pairs of conical wheels act as gears . . . mesh with self-tooth-forming chain to assure positive contact under all speed and load conditions.

A turn of the control screw changes the speed. The control screw simultaneously varies the effective diameters of the conically shaped wheels—closing one pair, spreading the other. This automatically, *instantly* adjusts the chain to provide a different output speed.

Contact your Link-Belt office or authorized distributor for more information about P.I.V. drives, ½ to 25 hp. Send for catalog.

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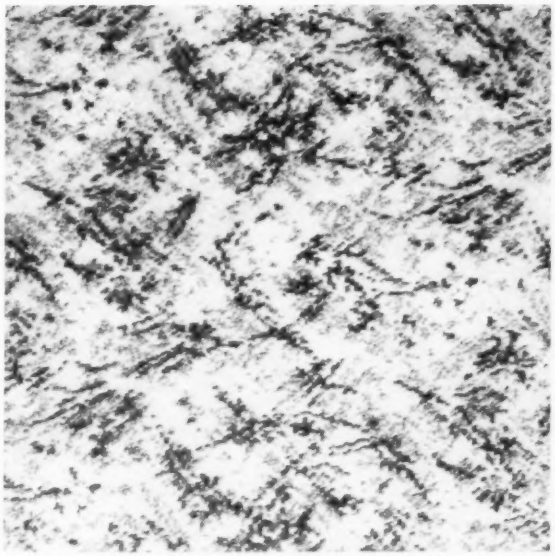


Are patterned carpets coming back? Roxbury Carpet Co. and James Lees & Sons Co. think so. The carpet on the left above is "Delmonico," a nylon Axminster by Roxbury; on the right is an all-wool pile carpet in James Lees' "Virginian" line.

Takashi Murayama, director of research for the All Japan Cotton Spinners' Association. No figures for the 1960 crop were released by the Chinese government, apparently because drought and flood cut the harvest to an amount considerably less than in 1959. The Red Chinese are one of the world's major cotton fabric exporters, shipping an estimated 500 million yards of fabric in 1959.

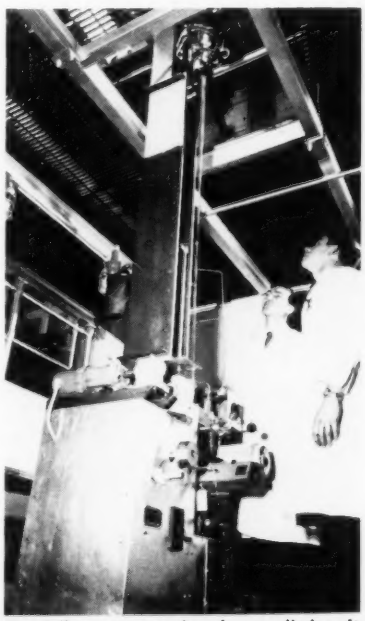
Imports Security Threat? The nation's textile organizations have asked the Office of Civil and Defense Mobilization for a finding that textile imports are threatening the national security. Their

petition stressed the essentiality of the industry to the nation's military establishment and its importance to the national economy, indicating that it qualifies for a favorable decision on both counts. The action was taken less than two weeks after President Kennedy, in outlining a seven-point program of government action on textile imports, gave assurance that such a petition would be "carefully considered on its merits."

Next KAE. The 46th biennial Knitting Arts Exhibition has been announced for Atlantic City's Convention Hall, April 29-May 3, 1963. The show's manager reports that the volume of space requests received so far from exhibitors is the largest number ever to come in at such an early date. There were 225 exhibitors at the 1961 show, which was attended by more than 16,000 members of the knitting industry.

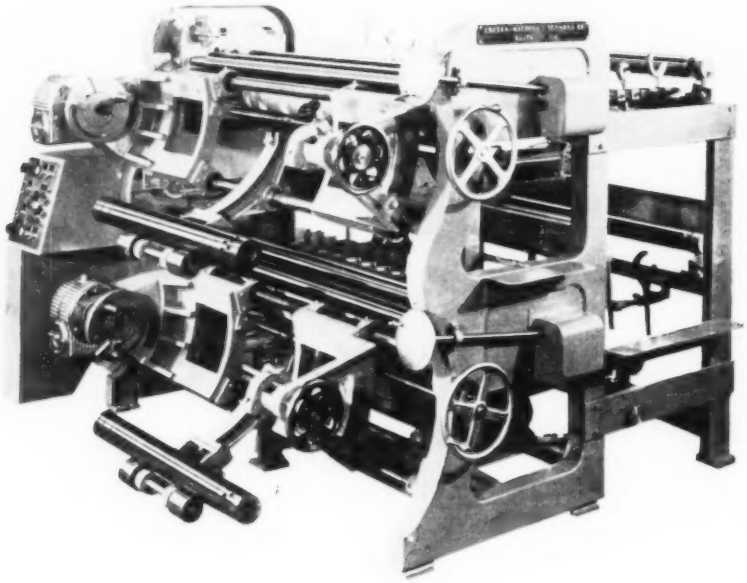
Sock-Standard Revision. Manufacturers of socks and anklets have been asked by the Commodity Standards Division, U.S. Department of Commerce, for their comments and suggestions on a proposed revision of Commercial Standard CS46-49, "Hosiery Lengths and Sizes." Changes provide a plus ½" tolerance in foot size, eliminating the minus tolerance; eliminate leg-length standards for seven types of hosiery; add leg-length standards for twelve types; divide men's half-hose and slack socks into four groups, providing a dress and a work category for each; and provide for minimum lengths with plus tolerances only.

Heat-Stabilized Tapes. Nylon



This fully instrumented and controlled melt spinning equipment was recently put into operation at Fabric Research Laboratories, Inc., Dedham, Mass., as part of their new experimental fiber spinning laboratory.

For Light Constructions



The Cocker Double Head Slasher

Produces 2 Loom Beams at One Time

Here are two superb slasher head units on one frame—each completely independent in operation and equipped with all the features which make Cocker Slashers the most efficient in the world.

Each Beam Has Its Own . . .

Incomparable GH & Torque Tube Drive*
Air Lift Calender Roll
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Individual Comb and Comb Adjustment
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This compact and economical double head slasher is available with a large variety of drives. If you slash light constructions it will pay you to get the facts on this two-in-one unit. Write today for full information.

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WORLD'S LARGEST DESIGNERS AND BUILDERS OF COMPLETE WARP PREPARATORY EQUIPMENT

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and Dacron webbings, tapes, and ribbons capable of maintaining a maximum breaking strength and minimum shrinkage when subjected to a temperature of 250 F for five hours are described in a report of research done by Narricot Corp. for the U.S. Air Force. Copies of the 80-page report are available at $2 from the Office of Technical Services, U.S. Department of Commerce, Washington 25, D.C. Order PB 171 486.

Canadian Wool Outlook. As it does in the U.S., the outlook for the Canadian wool industry depends on what action the government takes to give the mills a better chance to compete with imports, says the Canadian Woollen & Knit Goods Manufacturers Association. Until the government does something about a 1958 recommendation that a top policy decision on the future of the wool fabric industry be spelled out, no significant change in the unsatisfactory industry conditions can be expected.

New Kenaf Company. A new corporation, North Atlantic Kenaf International, Inc., has been formed at West Palm Beach, Fla., for the production and sale of seed, machinery, and fiber to the world kenaf industry. The same management operated a firm in Cuba until it was expropriated by Castro, and now operates in Guatemala and Haiti.

Import Facts. Textile imports last year swamped U.S. markets at twice the 1958 rate and have risen tenfold since 1948, according to final 1960 data compiled by the Northern Textile Association. Imports of textiles last year totaled

1.3 billion square yards, in contrast to the 131 million square yards imported only 12 years ago NTA said, basing its figures on Bureau of the Census data. Hong Kong passed Japan last year to become the number one exporter of cotton textiles to the U.S.; in wool textiles, Italy and Japan supplied nearly two-thirds of U.S. imports. Japan is still in second place in cotton textile imports, but the combined totals of Spain, Egypt, France, and Portugal increased thirty-three times in two years.

First-graders at Woodrow Wilson School in Framingham, Mass., enjoy benefits of experimental carpet installation by Roxbury Carpet Co. Carpeted classrooms are being tested by the company in three schools for comparative over-all costs, ease of maintenance, sound control.

Canadians Hurting Too. Hong Kong shipped to Canada 38.6 per cent more clothing and textiles in 1960 than in 1959—$8.3 million worth compared with about $6 million—according to a Canadian trade association report. A better perspective on these figures is obtained by remembering that Canada's population is about one-tenth that of the United States.

"Subsidy, Not Loan"—Rhodes. A straightforward equalization payment made directly to the cotton producer is advocated by F. Marion Rhodes, president of the New York Cotton Exchange, who recommends it as less costly to the taxpayer than the loan program, and at the same time a step forward in "moving our cotton into trade channels instead of government stocks." Under the present setup, he said, the taxpayer is compelled "to pay the cost of the loan programs and the export subsidy programs, and then is required to pay higher prices for cotton goods manufactured from high-priced cotton."

Cotton Loan Estimate. National Bank of Commerce, Memphis, Tenn., estimates that the loan for

the 1961 cotton crop, Middling inch at Memphis, will be 33.28 cents.

Ask Vinyl Standard. Setting up of a Commercial Standard for vinyl coated expanded fabrics for apparel use has been requested of the U.S. Department of Commerce by the Vinyl Fabrics Institute. VFI has submitted a proposal embracing basic performance requirements and test methods for evaluating hand, drape, appearance, wearing qualities, and resistance to temperature extremes.

"No more tight ends in our warps"

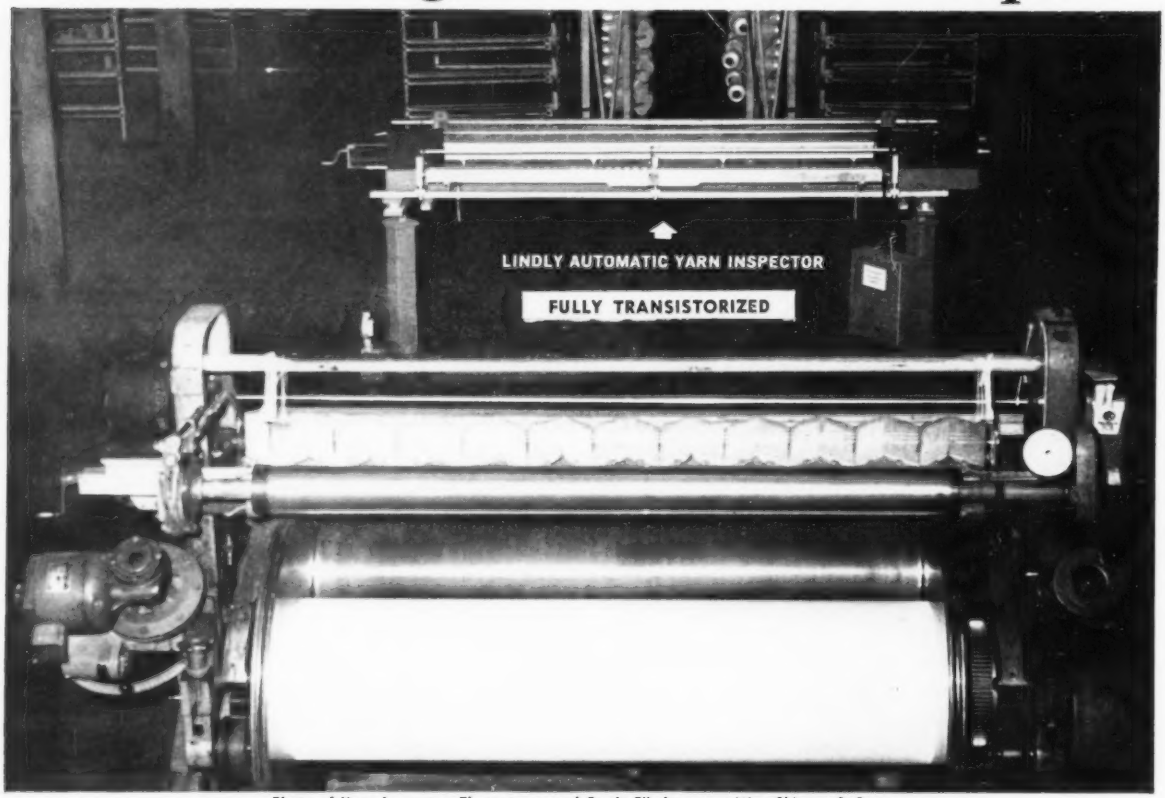
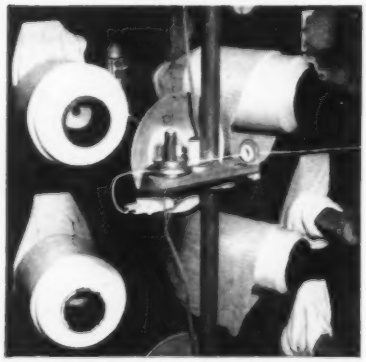


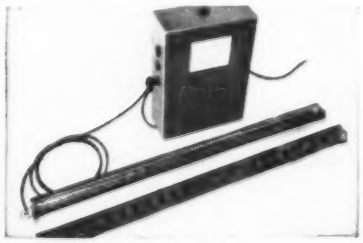
Photo of Yarn Inspector. Electrotense and Static Eliminator at Wm. Skinner & Sons

The LINDLY Electronic Triumvirate Gets the Credit

YARN INSPECTOR – ELECTROTENSE – STATIC ELIMINATOR



Closeup of Electrotense in creel.



Lance Static Eliminator — not visible in installation photo.

When we asked William Skinner & Sons, Holyoke, Mass. for a report on their installation of a Lindly Automatic Warp Yarn Inspector, the Lindy Electrotense in their creel and a Lindy Static Eliminator, their answer was prompt and enthusiastic: "No more tight ends in our warps."

However, when we asked them to go back temporarily to warping without the Lindly controls, so we could get some comparative "before" data, they flatly refused. "Why should we go through that again, when we don't have to?" they asked, and we can't blame them.

Since Skinner didn't need comparative data to prove the value of the Lindly Electronic Triumvirate, we doubt if you would either. So why not try an installation? Here's what the triumvirate is and does:

THE LINDLY AUTOMATIC YARN INSPECTOR is a high-speed, ultra sensitive photo-electric instrument for detecting yarn defects in warps, such as broken filaments, strip-backs and fluff balls. It can be made to operate a counter, a signalling device, or to actuate a machine stop switch — singly or in combination for any degree of imperfection.

THE LINDLY ELECTROTENSE for warp creels, winders, twisters, knitting machines, etc. provides completely uniform tension for any number of ends and the tension for all ends can be varied by turning only **one** dial. It consists of two conventional discs with an electromagnetic coil beneath. The lower disc is of non-magnetic brass, while the upper disc is of magnetic iron. When the coil is energized through a central electronic control, the upper disc is attracted downward, pressing the yarn between it and the lower disc in any degree desired. The pressure is pulsating, which prevents backup of twist and helps keep the tension discs clean and free turning.

LANCE STATIC ELIMINATOR, made in a variety of models, has a textile application wherever static electricity is a problem. It carries a high voltage discharge from pointed electrodes into the air, causing the fibre to be surrounded by ionized air, which serves to discharge the static electricity accumulated all around the surface of the fibre. Whereas the voltage is high enough to ionize effectively the air, it cannot harm the operator, who accidentally comes in contact with the electrodes.

FOSTER MACHINE COMPANY

ELECTRONIC SALES DIVISION, DEPARTMENT TI-7

Westfield, Massachusetts, U.S.A.

Southern Branch, Route 85, Belmont, N. C.

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RECENT TECHNICAL AND COMMERCIAL DEVELOPMENTS

by J. B. Goldberg
Consultant to the Textile and Allied Industries

Exclusive

FIBERS AND YARNS

High Strength Triacetate. It has been reported that a new, high-strength triacetate fiber is under development in England.

Improved Polyester Fiberfill. Type 88 Dacron polyester fiberfill is said to have about 20% more bulk in comforters than the fiberfill heretofore available. The higher degree of bulk is achieved through a unique crimp structure. It is planned to offer this new Dacron for use in pillows and sleeping bags at a later date.

Straw-Type Rayons. Recently exhibited in New York was a group of experimental circular knit fabrics using a flat filament rayon "straw" produced in Switzerland. This yarn, "Pontova," is available in deniers of from 320 to 6,000 and has been previously used primarily for millinery fabrics. Other dress goods samples were shown with a hollow-filament multifilament yarn, made in 300, 600, and 1,000 denier sizes.

New Nylon Fiber. Du Pont is planning pilot plant output of their new "HT-1" nylon fiber which features high temperature resistance. It is anticipated that application will be in supersonic aircraft tires, military clothing, and in parachutes exposed to high temperatures. Other non-military uses are seen in filtration fabrics for high temperature gases, in electrical insulation, and for special beltings and in high-temperature hose. The new nylon is reported to withstand temperatures of up to 840 F without fusing or burning.

Improved Avril. The American Viscose Corp. has disclosed data on an improved version of their original Fiber 40, later named "Avril." Tenacity is now 5 grams per denier dry and 3.5 grams per denier wet, with stress-strain characteristics claimed to be similar to those of cotton. It is also reported that fabrics of blends with Dacron polyester fiber provide cover, luster, and automatic wash-wear performance superior to conventional polyester-cotton blends.

Novelty Filament Rayon Yarns. A British company reports development of a device to produce random slub rayon yarns. The same concern introduced the only two-color spun-dyed rayon filament yarn last fall, with good acceptance in novelty lining fabrics.

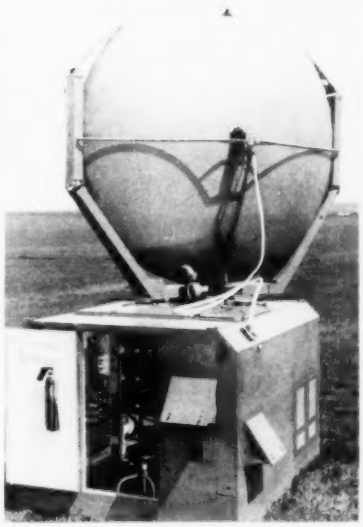
New Zefran Fiber. Dow Chemical Co. is offering Zefran acrylic fiber 1207 as an improved type for blending with wool. It is claimed that dyeing characteristics for blends permit deeper shades and a broader range of colors.

Polycarbonate Fibers. The Japanese Teikoku Rayon Co. is said to have developed a process for the manufacture of polycarbonate fibers.

MACHINERY AND PROCESSES

Hosiery Automation. Five new automatic devices for the ladies' seamless hosiery industry have been announced by Morpul Research Corp. Included are devices for lubrication of knitting machines, coating of nylon yarn, collection of hosiery, an inspecting board, and a foot-operated counter.

Cleaning Natural and Synthetic Fibers. Patented by a South American company is a process for cleaning and orienting a random mass of dirty fibers by mixing them with a cleaning agent. The cleaning agent consists of cereal grains in the form of palpable particles, and the mass is pulled through them while orienting them parallel to the direction of movement so as to rub them and the cereal particles against each other.



Inflatable antenna of this Portable Scatter Communication Terminal is an 8-ft parabolic reflector formed by two flexible coated fabric sections. Fabric has a polyester base, coated with neoprene. One section is also coated with metallic material to serve as a reflector for radio signals. The fabric was developed by Aldan Rubber Co.

TEST METHODS

Ends-Down Recorder. A Greenville, S. C., firm is mill-testing a device for recording details of ends down in spinning. Device records on a chart the time of an end break, time it is down before piecing-up, and break frequency for individual spindles.

New ASA Tests. Three newly revised standards for textiles, covering test methods for woven fabrics, wool and part-wool fab-

Continued on page 136

Plant addition stabilizes weaving mill for Dundee

Dundee
MADE IN U.S.A. SINCE 1888

Severe vibration set up by high speed looms threatened to destroy building at left. New structure at right served as buttress to steady original mill and also provided valuable addition to Dundee's production area.

Interior view showing looms in original building on right of floor plate and additional looms in new building at left. Original weave room wall was removed so that operations between the two buildings may be completely integrated.

Dundee Mills, producers of fine textiles since 1888, called in Robert & Company Associates when severe vibration was causing serious deterioration of the weaving building at their #1 mill in Griffin, Georgia.

After a thorough study of the problem, Robert & Company engineers designed a "buttress" in the form of a two story addition with strength to spare. This modern two story building not only gave new life to the older 60,000 sq. ft. building by reducing vibration, but also provided Dundee with a valuable addition to their production area.

Perhaps your mill can profit from Robert & Company's 42 years experience in working with the leading names in textiles.

ROBERT AND COMPANY ASSOCIATES
Textile Engineering Division
ATLANTA

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EXECUTIVE VIEWS

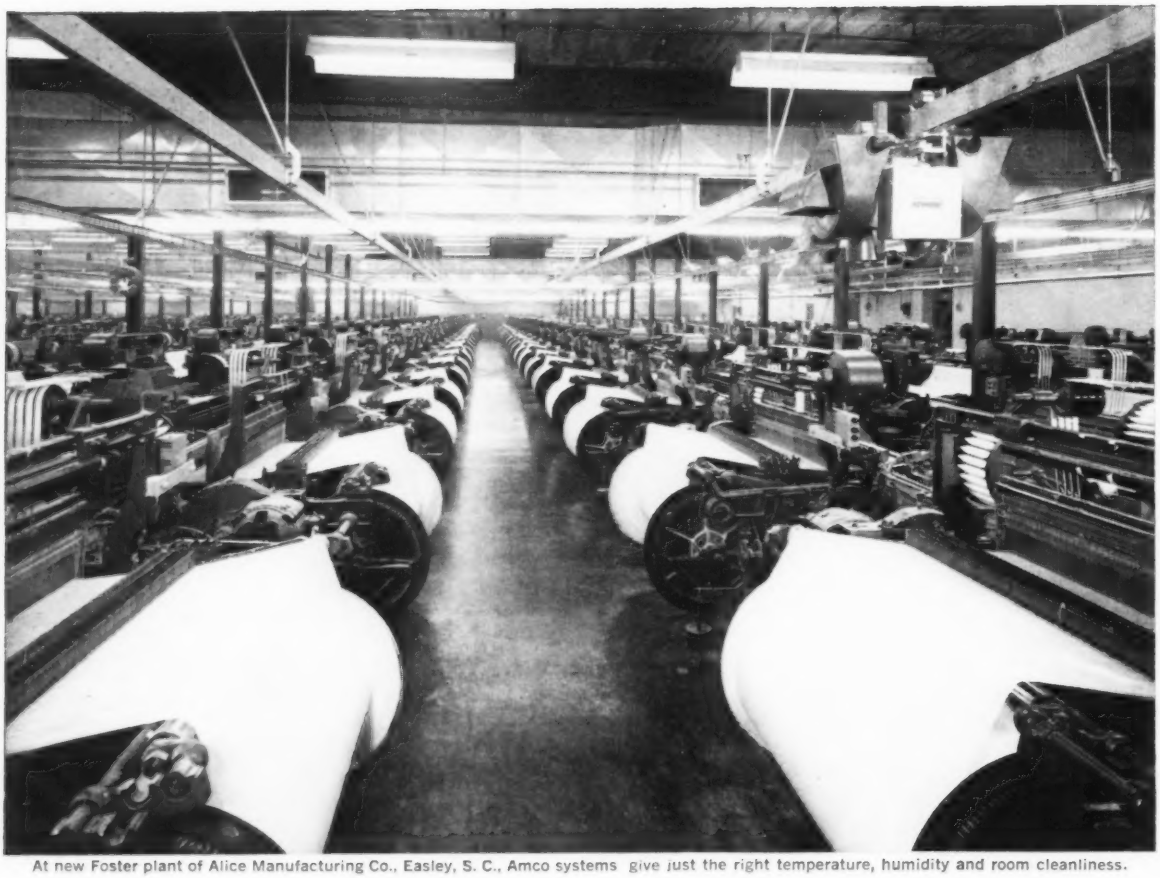
Price: No. 1 cotton fiber property

DURING MAY we had the opportunity to attend two Mid-South cotton meetings. A recurrent theme at both was that we must have more and better research to develop more and better ways to tell us how badly the ginner has damaged the spinnability of cotton by overdrying and overcleaning it.

Or, as more diplomatically phrased by Southern Regional Research Laboratory's R. J. Cheatham at one of the meetings, we need "the development of precise and rapid methods for measuring physical properties of cotton fibers, particularly length distribution (short fibers) so that *presently available* cottons can be selected and blended in the proportions required to yield optimum processing efficiency and product quality" (italics ours). In other words, "Sure, much of the cotton we get today is lousy, but we can't expect anything better. So let's develop some fast ways of measuring just how lousy it is so it won't be such a shock when it gets to the spinning room."

We are certainly all for research, just as we are for Mother, the dog, and baseball. But first, we don't believe that there can any longer be a question, if there ever could, that the cause of the cotton mill's quality problems is at

"Sorry—I can't hear you from up here!"



At new Foster plant of Alice Manufacturing Co., Easley, S. C., Amco systems give just the right temperature, humidity and room cleanliness.

Amco systems control temperature, humidity, room cleanliness at ALICE Manufacturing Company

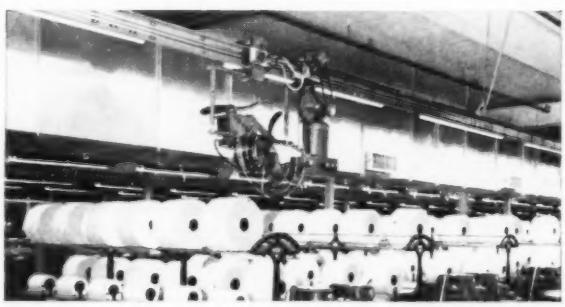
Alice Manufacturing Company is noted for its fine print cloth. One big reason for its success: rigid quality control.

Exact temperature, humidity and room cleanliness control is a must in this manufacturer's quality control set-up. That's why Amco Central Station Air Conditioning, Amco Ceiling Cleaners and Amco Heliclone® Loom Cleaners are on the job!

AMCO AIDS OUTPUT, CUTS WASTE

Here's how Amco-controlled temperature, humidity and room cleanliness help improve quality and boost production. They keep materials in top condition during each processing step to assure stronger, smoother, more uniform fabric. They permit closer machine adjustments, higher machine speeds. They reduce broken fibers, dust, fly . . . greatly decrease the need for cleaning . . . eliminate troublesome static electricity.

You can always rely on Amco to give you dependable advice and expert installation best suited to your needs. Why not learn how Amco can help *your* mill? Contact your nearest Amco representative today.



Combing department at Alice Manufacturing Co. relies on Amco Central Station Air Conditioning and Amco Ceiling Cleaner. Consulting engineers: Campbell and Leppard.

AMCO

Since 1888

Air Conditioning Equipment — Textile Specialties

American Moistening Company, Cleveland, North Carolina
Branches: Atlanta, Ga., Providence, R. I., Toronto, Ont.

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the gin. This has been proved again and again—in 1951 in the "17-Mill Test;" in 1958 in another ginning-spinning test on a large scale; in sundry laboratory and field tests conducted by the USDA, TRI, ITT, and others; and most recently in a research project reported in this issue of TEXTILE INDUSTRIES (see page 56).

The results are always the same: Overdried and/or overmachined cotton is damaged cotton.

Research can't do anything about the basic cause of damaged cotton. We think that one of the most cogent statements at either of the cotton meetings we attended was this remark by J. M. Leahy of a Dallas cotton firm: "Gentlemen, let's face it—the most important cotton fiber property is price."

As long as the cotton producer can upgrade his cotton by having it overdried and overmachined at the gin, with the government guaranteeing him a market where price is based solely on grade and classer's staple, he will continue to demand that the ginner overdry and overmachine. And he would be more than human if he gave much thought to the problems he has created for some spinner in South Carolina.

On occasion, we must admit, we have gotten in line to beat the USDA over the head because of this situation. But actually the USDA can be charged with very little of the responsibility, except insofar as some of its empire builders have maneuvered to maintain their vested interest in the status quo.

The real responsibility lies with the numerically small but politically potent cotton bloc; and as long as the U.S. Treasury is available, they too are not likely to worry about the South Carolina spinner's problems.

And no amount of fiber research will change that.

FUTURE EVENTS

Date	Event	Location
July 10-14	Gordon Research Conference on textiles	Colby Junior College New London, N. H.
Sept. 7-8	Combed Yarn Spinners Association annual meeting	The Greenbrier White Sulphur Springs, W. Va.
Sept. 9	Southeastern Section AATCC	Callaway Gardens Pine Mountain, Ga.
12-14	Southeastern Maintenance & Engineering Show	War Memorial Coliseum Greensboro, N. C.
12-14	Southeastern Plant Engineering & Maintenance Seminar	Town Hall Greensboro, N. C.
14-15	Northern Textile Association annual meeting	Poland Spring House Poland Spring, Me.
14-15	Textile Processing Symposium, sponsored by American Gas Association	Clemson House Clemson, S. C.
15	Delaware Valley Section AATCC	Wilmington, Del.
15-16	Palmetto Section AATCC	Clemson House Clemson, S. C.
21-22	Carded Yarn Association annual convention	The Cloister Sea Island, Ga.
21-22	Southern Textile Methods & Standards Association	Clemson House Clemson, S. C.
21-22	Chattanooga Yarn Association outing	Read House Chattanooga, Tenn.
23	Piedmont Section AATCC	Hotel Barringer Charlotte, N. C.
27-29	AATCC national convention	Hotel Statler Buffalo, N. Y.
Oct. 7	Alabama Textile Operating Executives carding and spinning discussion—9:30 a.m.	Thach Auditorium Auburn, Ala.
Oct. 11-13	Quartermaster Association national convention	Biltmore Hotel Atlanta, Ga.
11-21	International Knitting Machinery & Accessories Exhibition	Belle Vue Hall Manchester, England
11-13	Fiber Society	West Point, N. Y.
12-14	Symposium on Permanent Finishing, sponsored by Swiss Association of Textile Chemists & Colorists	Zurich, Switzerland
14	Textile Operating Executives of Georgia slashing and weaving discussion	Ga. Tech Atlanta, Ga.
14	South Carolina Div. STA	Clemson, S. C.
Oct. 16-20	National Safety Congress	Hotel Hilton Chicago, Ill.
Nov. 1-2	Textile Engineering Div. ASME	MIT Cambridge, Mass.
Nov. 8-9	Chemical Finishing Conference	Sheraton Park Hotel Washington, D. C.
13-15	Narrow Fabrics Institute	Statler Hilton New York City

Textile men and right-hand threads

A good friend of ours, a textile man, had the bad judgment recently to write a letter to a local newspaper—bad judgment because in the letter, which the newspaper printed, he made some very pointed criticisms of the John Birch Society. And he signed the letter.

For those who aren't aware of the activities of this group of super-patriots, we think that another textile man's comment describes the Birchites very succinctly: "Some nuts have a left-hand thread; these have a right-hand thread."

What followed is best described in our friend's own words: "You have no idea of the number of menacing and abusive phone calls that I received as a result of that letter. Many callers simply shout-

Continued on page 122

Now

UNIFIL®

features 8¾" quills for cotton weavers

The 8¾" quill UNIFIL developed specifically for the cotton mill is another example of how Leesona's applied textile knowledge leads to textile machinery that improves manufacturing, reduces costs and results in higher quality fabrics.

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LEESONA

Leesona Leads to Better Fabrics

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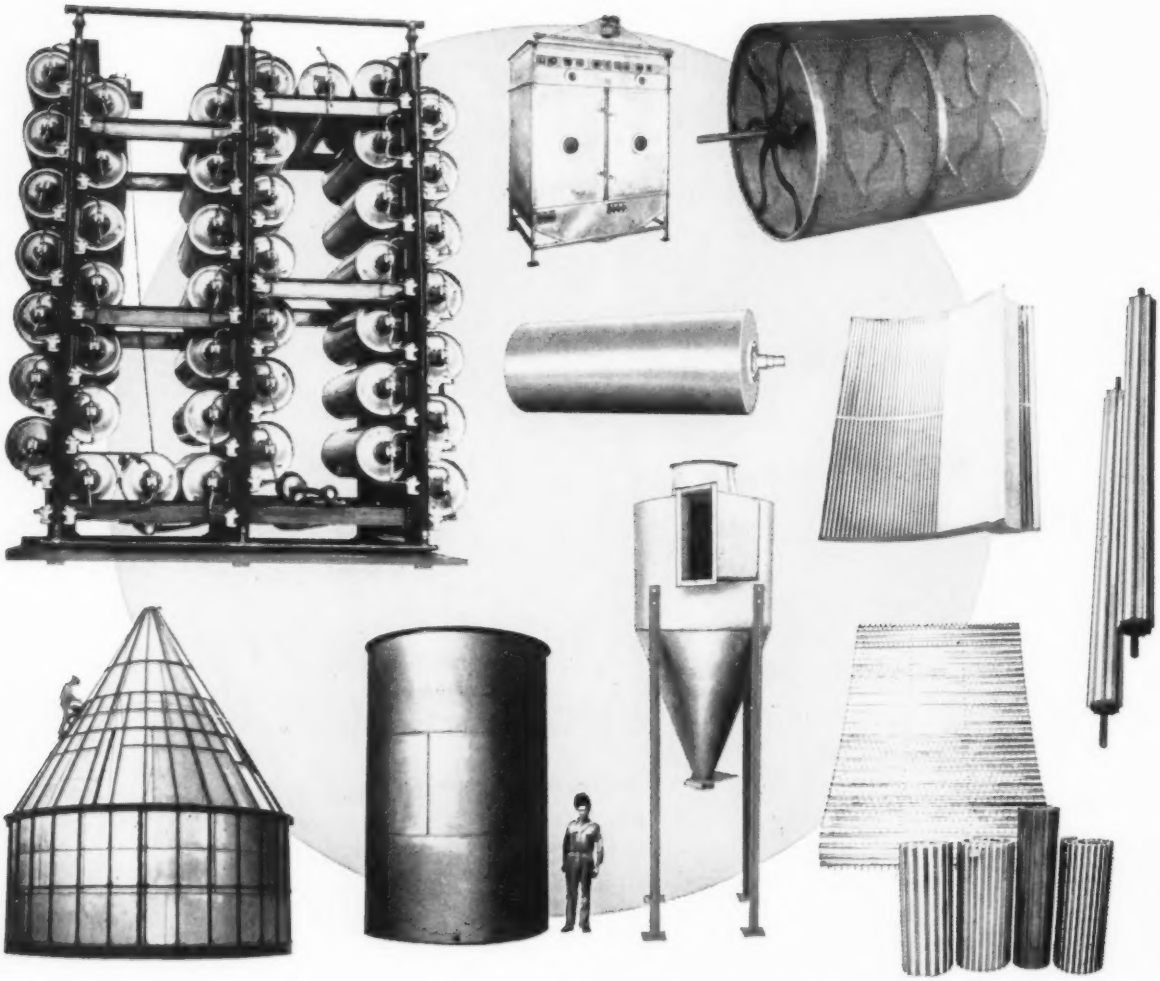
"Custom tailors" to industry

Since 1926, Sims has been designing and fabricating the specialized equipment called for in the manufacture of textiles.

As "custom tailors" of stainless steel, Sims' recommendations, designs, and fabrications are dictated by your particular problem, need, requirement or application of equipment. And, Sims specialists are on the job from start to finish to assure meticulous attention to even the smallest detail... the craftsmanship that unconditionally guarantees that the finished product will meet and surpass your most exacting specifications.

rolls · vessels · kettles · coils · size boxes · linings · cylinders · machinery · air and material handling systems . . . for textile · chemical · food processing · pulp-paper and other industries



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Harley D. Hohm, Inc., 128 Buist Ave., Greenville, S. C.
Friday Textile Machine & Supply Co., Gastonia, N. C.

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METAL WORKS
WEST POINT, GEORGIA

Specialists in
Stainless Steel Fabrication

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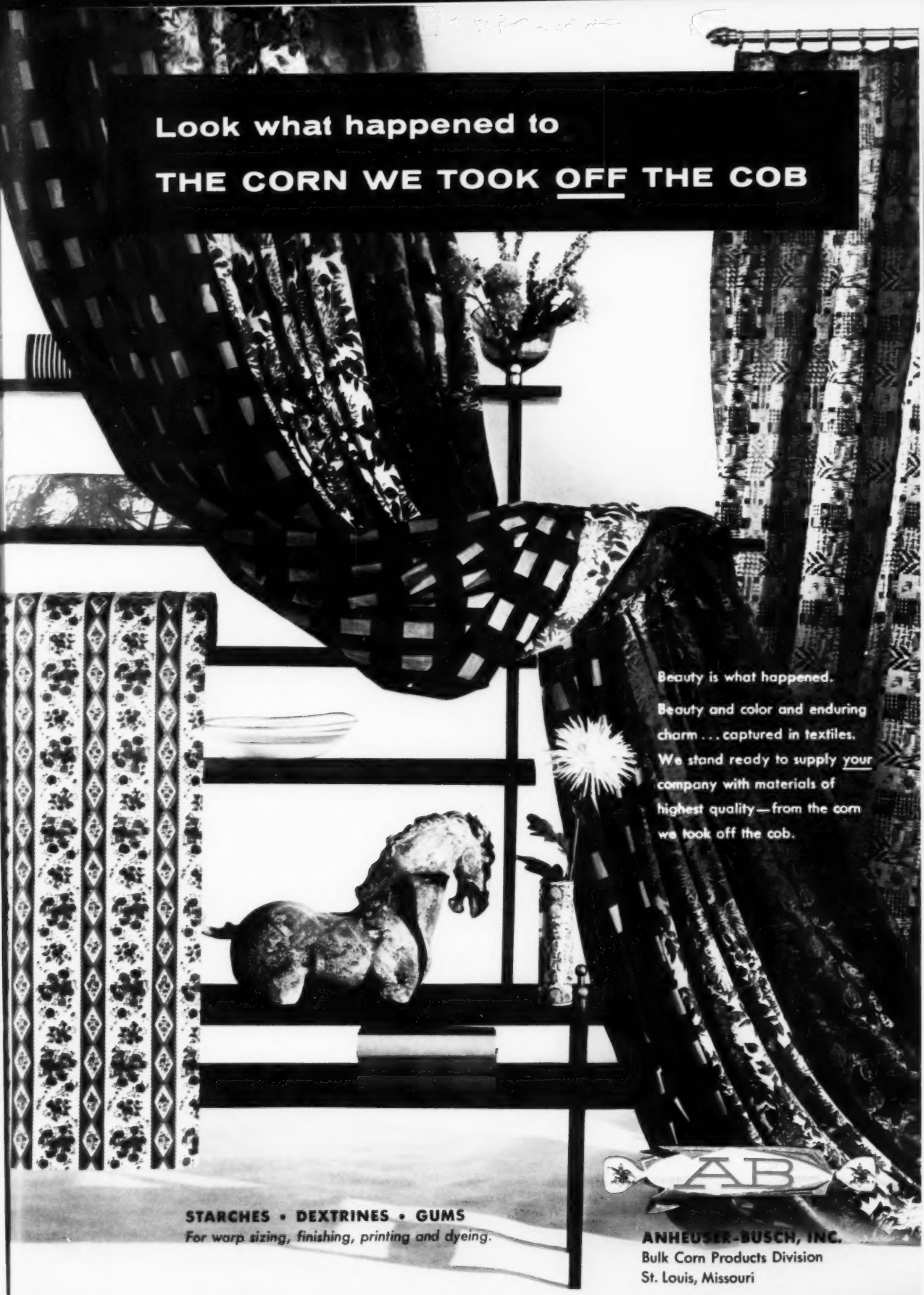
Look what happened to
THE CORN WE TOOK OFF THE COB
Beauty is what happened.
Beauty and color and enduring charm . . . captured in textiles. We stand ready to supply your company with materials of highest quality—from the corn we took off the cob.
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STARCHES • DEXTRINES • GUMS
For warp sizing, finishing, printing and dyeing.
ANHEUSER-BUSCH, INC.
Bulk Corn Products Division
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ROYAL WORCESTER INDUSTRIAL CERAMICS LIMITED

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HARD CERAMIC TEXTILE GUIDES

'Regalox' Ceramic Thread Guides possess a hardness of between Sapphire and Diamond (9 Mohs) and combine the qualities of resistance to abrasion, great mechanical strength, resistance to mechanical and thermal shock and chemical reaction.

'Regalox' means — long life, low maintenance and a better finished product.

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TIME–
MONEY---

Save All Three with Square D QMB POWER PANELBOARDS

MOTOR STARTERS AND BREAKERS OR SWITCHES COMBINED IN ONE SPACE-SAVING PANELBOARD!

FACTORY-WIRED AND ASSEMBLED OR ENCLOSURES AND COMPONENTS AVAILABLE FROM YOUR SQUARE D DISTRIBUTOR!

BREAKER AND SWITCH UNITS ARE EXCLUSIVE PLUG-IN CONSTRUCTION. INSTALLED OR REARRANGED IN MINUTES!

If the above installation had been made the old way —with trough, and ganging separate switches and starters—it would have taken at least six feet of wall space instead of 30 inches, and four times the installation time.

After this panelboard is installed, Square D's exclusive *PLUG-IN* design permits circuit changes without costly down time. For extra safety, plug-in units are mounted directly above starters, permitting interlocking. No starter or disconnect door can be opened when switch is "ON."

QMB panelboards accommodate reversing or non-reversing starters, sizes 0 through 4; plug-in circuit breakers through 225 amperes; plug-in switches through 200 amperes (bolted through 600 amperes).

Twin Unit (above) available 15-100 amperes
Single Unit available 125-225 amperes

Exclusive Breaker Unit Advantages:

Plug-in construction • Each unit in individual steel enclosure with dead-front construction • Combine switch and breaker units in same panelboard, if desired

Write for the complete story—Square D Company, Mercer Road, Lexington, Kentucky

SQUARE D COMPANY

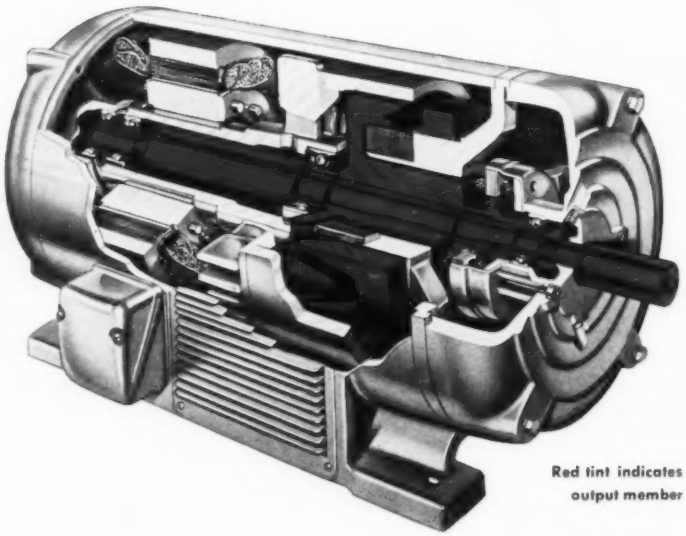
wherever electricity is distributed and controlled

NOW— another FIRST by the Originator of Eddy-Current Equipment

NEW

DYNAMATIC®

Model 905 Ajusto-Spede® Drive



Red tint indicates output member

Extends Capacity Range to 15 HP in the Popular Quill-Type Design

The addition of the new model ACM-905 to the famous ACM-903 and ACM-904 lines of Dynamatic Ajusto-Spede Drives makes the desirable features of Dynamatic Quill-Type design available for many new applications.

Dynamatic Ajusto-Spede Drives provide controlled adjustable speed from an AC power source. Standard control features include on-off clutch control, infinite speed adjustment, constant speed regulation, and jogging. Any of a variety of special features may be easily and economically added to the standard control.

All Quill-Type models are available with either eddy-current, Dyna-torQ, or fail-safe brakes.

An Ajusto-Spede Drive, a control unit (either electron tube or transistorized magnetic amplifier), and a push-button station comprise a compact, easily installed, low-cost drive package.

Check these Ajusto-Spede® Advantages

- ★ **Infinitely adjustable speed from AC power**
- ★ **Simplified construction**
- ★ **Compact design**
- ★ **Wide speed range**
- ★ **Remote control**
- ★ **Stationary field coils**
- ★ **Excellent performance characteristics**

Send for Illustrated Descriptive Literature

EATON®

EATON

DYNAMATIC DIVISION

MANUFACTURING COMPANY

3122 FOURTEENTH AVENUE • KENOSHA, WISCONSIN

For further information use Handy Return Card, Page 149

Picker Overhauling Is Simple When You Depend On . . .

Aldrich Repair Service

We furnish skilled men for reworking pickers, and can deliver to these men any needed parts within 24 hours in most southern states, and within 48 hours to almost any cotton mill in the United States. This makes thorough overhauling a simple matter. Anything needed for a good job can be had at once, while the machine is down for repairs.

If you do your own overhauling, this speedy delivery service is just as valuable. You don't have to wait for repair parts — they are there when you want them.

We manufacture and install complete blending, opening, and picking systems for cotton and synthetics, and cleaning systems for cotton.

Aldrich Machine Works

Greenwood, South Carolina

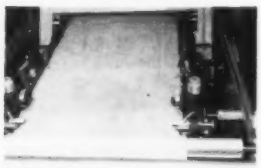
• TENTERING • PRINTING • TUBING • EXAMINING • REWINDING

GPE Controls

CLOTH GUIDES

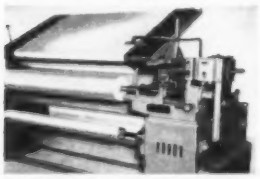
save time . . . money . . . material!

Choose from 43 models of GPE Controls Cloth Guides!



Medium-duty double unit with air sensing, positioning rails on tenter frame for higher speeds.

Photoelectric reflected light head senses cloth position by following printed line or selvage.



Light-duty unit with air sensing, applied to examining machine. Similar unit is used in tubing operation.

★ Highest-speed tentering with minimum selvage and no mis-pinning.

★ Speed up printing operations while you keep accurate side register.

★ Non-clog air sensing head (patented) never touches cloth, works perfectly with all kinds of materials—linty, dusty, abrasive, high-pile, sized, wet or dry.

★ Light-weight or open-weave materials, such as lace, scrim, and gauze, are easily guided, as well as heavy materials such as carpeting and canvas.

★ Can be set to guide on the nap of carpeting, velvets, and other high-pile materials.

★ Cloth edge position, porosity, opacity, or reflectance sensed by air or photoelectric heads.

★ Slit without side trim!

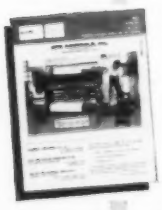
★ Hydraulic actuation for unlimited power and speed, high frequency response.

★ Engineered for the textile industry by specialists in industrial automatic controls. Designed for long life and minimum maintenance.

GPE controls

Subsidiary of General Precision, Inc.

ATTACH COUPON TO YOUR LETTERHEAD FOR FREE CATALOG



GPE Controls, Inc.
260 E. Ontario St., Chicago 11, Ill.

Gentlemen:

Please RUSH me your Catalog EG84, describing GPE Controls cloth and web guiding systems. I am particularly interested in applying cloth guide control to a .....
(type of machine)

☐ Have your technical representative call.

PERSONAL NOTES

E. G. Holland has joined Proximity Print Works, Greensboro, N. C., division of Cone Mills Corp., as overseer of the bleachery. * * * **Alfred H. Randall** has been named manager of the Salisbury (N. C.) plant succeeding **Stedman Morris,** who will assist Mr. Randall as business manager.

Albert G. Myer, Jr., formerly vice-president and treasurer, has been elected president of Textiles, Inc., and Threads, Inc., succeeding the late John Land. **T. R. Hosick** was named secretary-treasurer and **John Loppen** was elevated to vice-president.

Louie Burkes has been named president of the Postex Mills, Post,

Mr. Burkes

Texas, a division of Burlington Industries, Inc., succeeding **R. J. Jennings,** who has retired. * * * **Arthur West** has been appointed vice-president of Charm Tred Mills. Mr. West has general responsibilities for overall manufacturing and product development. He is headquartered at the Monticello, Ark., plant. * * * **John G. Gravlee, Jr.,** has been elected president of Burlington Throwing Co. Mr. Gravlee will continue to make his headquarters at the Hillcrest plant in High Point, N. C. * * * **Charles F. Myers, Jr.,** and **Stephen L. Upson** have been elected executive vice-presidents of Burlington Industries, Inc. **Henry E. Rauch** has been named senior vice-president, and **Arthur E. Weiner** has been elected vice-president. **Douglas M. Orr** has assumed duties as secretary and associate general counsel. **William S. Markham, Jr.,** and **John B.**

Continued on page 46

Here where steel touches steel, Marathon Rings meet the challenge

Here, where surface finish is critical, where the traveler continually contacts the ring, Saco-Lowell **Marathon Rings** bring you a special, more effective answer. Delivering fine performance at low cost, these soundly-engineered rings give top dollar value.

The ring that's hard enough to resist wear has traditionally presented starting-up problems. Softer rings, or rings with a softer "shell," solve one problem but introduce others. High polish has drawbacks, too. The trapping of abrasive impurities, or "dross," is one. Another is the actual increase in coefficient of friction that results, strange as it may seem, from extreme smoothness.

What is Marathon's better answer? Hard steel with a matte-finish surface produced by a revolutionary specialized process involving no dross. Smooth enough to shorten break-in time, not enough to create resistance to the traveler. No need for a soft steel casing. And priced surprisingly low.

True, Marathon Rings don't glisten like the more expensive rings you may be using now. That's because they're made for just one purpose: to do a good, steady job in the most economical manner possible. Get in touch with your nearest Saco-Lowell representative soon. See the difference Marathon Rings can make. Like all Saco-Lowell products, they're **built for better performance... backed by better service!**

THE STANDARD OF QUALITY AND PERFORMANCE Since 1813

SACO-LOWELL SHOPS

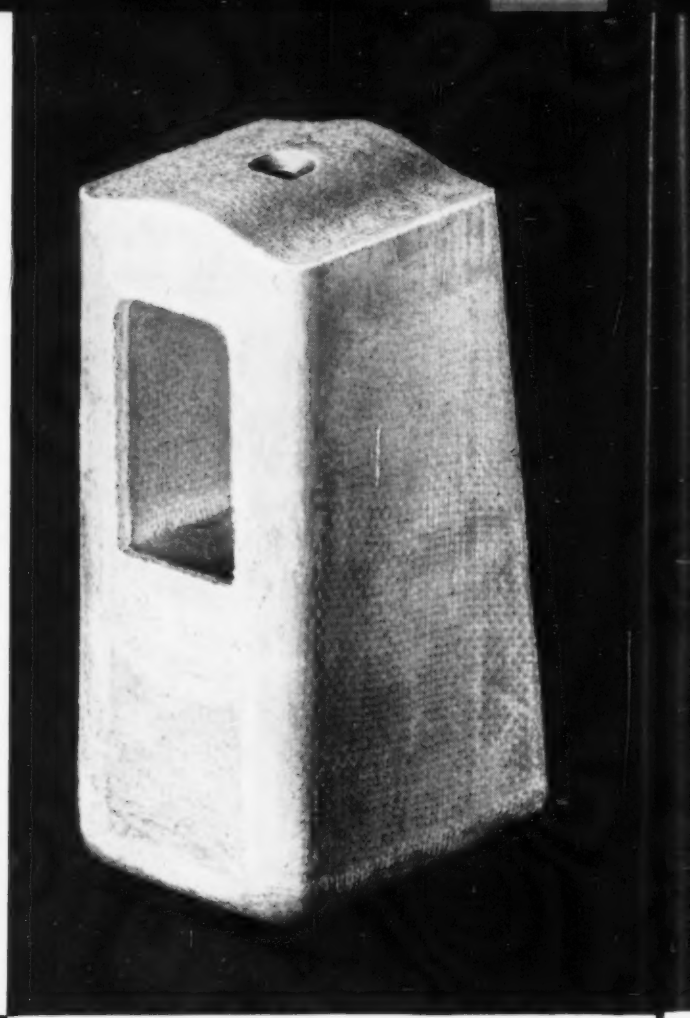
REPLACEMENT PARTS DIVISION

EXECUTIVE OFFICES: DRAWER 2327, GREENVILLE, S. C.
SALES OFFICES: ATLANTA, GA.—805 PEACHTREE ST., N.E.
GREENVILLE, S.C.—P.O. Box 1698; CHARLOTTE, N.C.—P.O. Box 149;
GREENSBORO, N.C.—601 N. Elm St. Bldg.; SACO, MAINE—P.O. Box 230

You name it,

Dayco makes it...

a Thorobred Picker to handle any assignment!



1. Dayco Thorobred Premium Loop Picker, readily identified by its gold back . . . rugged and always reliable.

Newest of Dayco's Thorobred Drop Box Pickers is the Golden Thorobred, fully molded in one piece from an ultra-high molecular polyester. Careful in-use studies show that its life expectancy is 10 times that of the conventional picker. If you've used the Golden Thorobred Drop Box Picker and liked it, you may wish to try the Golden Thorobred Loop Picker, now available in many sizes.

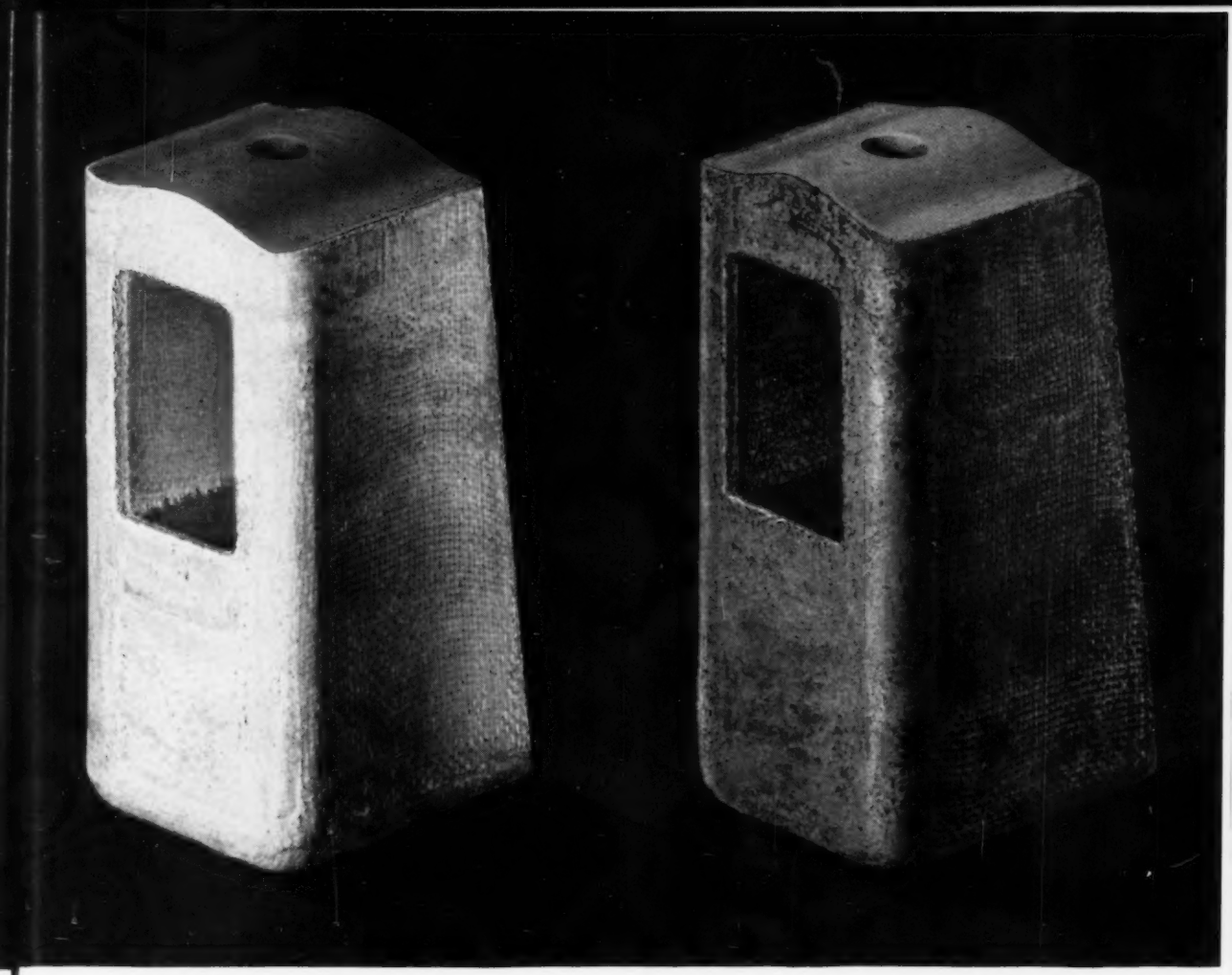
Meet the full family of Dayco Thorobred Loop Pickers! With their help, you'll substitute high production levels for the down-time so often resulting from picker trouble. You'll see the difference in cloth quality that superior picker performance can make. And you'll see a big difference in *quantity*, too.

First, the Dayco Premium Picker. It's really rugged —so sturdy and resilient it amazes even experienced mill men. Once they've become accustomed to its superior performance—even in operations that require the very best—they're sold on Dayco Premium! And little wonder. Keeping perfectly in time through millions of picks, the Premium stays on the job far past normal time for replacement.

Bring On Your Toughest Assignment

Perhaps the best way to explain what the Dayco Premium Picker can do is simply to say: bring on your toughest assignment. See the way that this quality loop picker will tackle it. You'll like what you see.

A second outstanding loop picker from Dayco is the Dayco Thorobred Super. Very likely you're already familiar with the Super, for its record of fine



2. Dayco Thorobred Super Loop Picker, white with red back . . . designed with modern loom requirements in mind.

3. Dayco Thorobred Standard Loop Picker, black with red back . . . for excellent service on E model looms and slower.

performance comes into the conversation almost as often as textile men talk shop together.

Like the Dayco Premium, the Super is fully able to cope with the demands of modern weaving equipment. It's able to withstand the weight of heavier plastic shuttles . . . it's at home with longer quills and higher loom speeds. Use the Dayco Thorobred Super Loop Picker and see if you don't agree: its ability to withstand the continual thrust of the shuttle—without loosening or early wear—is truly impressive.

Pay For What You Need

Economy of operation dictates, of course, that you pay for no more than you need. Yet, even where less is required of a picker, it must fully measure up to what *is* required, or "economy" turns into expense and waste. Dayco again supplies the answer: the Dayco Thorobred Standard Picker, recommended for E Model and slower looms.

Like the Premium and the Super, the Dayco Standard Picker is built in one piece. There's nothing to break or distort when it's driven onto the stick. And, like all Dayco Thorobred Pickers, the Standard gives perfect shuttle contact. The picker-stick hole is slightly tilted. The flared bottom permits easy, accurate seating. And the Standard stays exactly in position, for perfect alignment with the shuttle.

Pick a Dayco Picker

How can a lower-priced picker offer so much? The answer is simple. Dayco engineers design *each* picker to measure up to the demands that will be placed on it. But the same basic principles . . . procedures . . . and precision that help make the Premium as good as it is are adhered to in producing *every* Dayco picker.

Premium, Super and Standard, they're available in many sizes, to meet every possible requirement. So to pick the picker that's best for any given operation, simply contact your Dayco jobber. Or write or phone Dayco Textile Products Co., 401 S.C. National Bank Bldg., Greenville, S. C., for further information. Overseas Plant: The Dayton Rubber Co., Ltd., Dundee, Scotland.

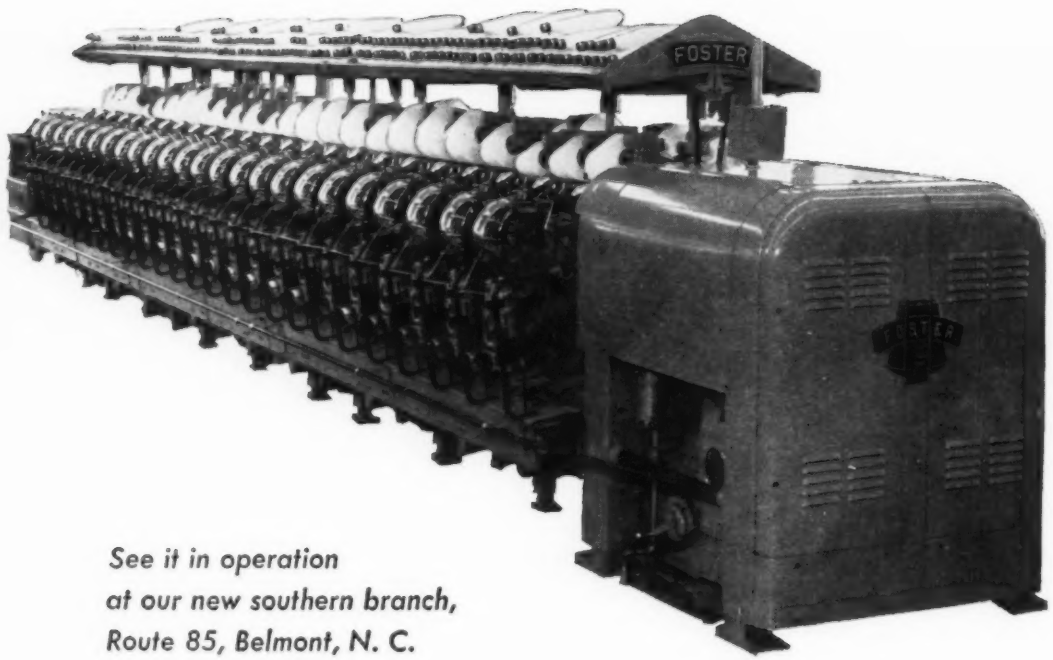
Dayco
TEXTILE PRODUCTS

Dayco

Division of Dayco Corporation

Now Available! FOSTER MODEL 506

Major Reduction in Operating Costs
Greatly Improved Yarn and Package Quality



See it in operation
at our new southern branch,
Route 85, Belmont, N. C.

SEEING IS BELIEVING

See the Foster Model 506 Automatic Cone Winder in operation at our new southern branch, Interstate Defense Highway 85, at Belmont, N. C. and/or arrange to observe machine operating under mill conditions.

NEW SOUTHERN BRANCH ON ROUTE 85, BELMONT, N. C.

FOSTER MACHINE COMPANY

WESTFIELD, MASSACHUSETTS, U.S.A.

72-1

For further information use Handy Return Card, Page 149

AUTOMATIC YARN WINDER

PRACTICAL AUTOMATION Automation of sales yarn winding equipment must be **practical.** By that we mean that the investment required by the mill must not be out of proportion to the return and that savings in winding costs must **not** be achieved **at the expense of yarn and package quality.**

This philosophy has inevitably led to a step-by-step process in the automation of Foster sales yarn winding machines: — first automatic slubbing and cleaning, automatic disposal of empty bobbins and automatic cone size indicator on our manual winders; and now, in addition, an automatic supply bobbin exchanger on the Model 506, plus a greatly improved cone size indicator. Donning and doffing of cones are still done by hand on the Model 506, because automation of these operations would not justify the expense.

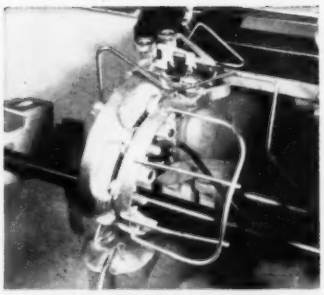
WHY NOT AUTOMATIC KNOT TYING? We have **not** made knot tying automatic on the Model 506, because we have proved, to our own satisfaction, that it can be done **only at the expense of yarn and package quality.** Automatic knot tying permits loose yarn (butterflies), tangles, bobbin rings, crossed ends, uneven package density and rough yarn, and these defects can be discovered only when it is too late. What price savings in winding costs, if they result in a loss at the market place?

HOW WE SIMPLIFY HAND OPERATIONS Since certain operations in sales yarn winding must still be done by hand, it follows that they should be simplified for maximum efficiency. The donning and doffing of cones involve no problem. They have been as simple and easy as possible for a long time. The other hand operations, however, have presented an opportunity for improvement and we have reduced these operations to 3 simple movements: — 1. dropping the bobbin supply in a chute. 2. tying the knot with the left hand, by means of a high speed mechanical device. 3. instantaneous restart of the spindle with the right hand (see illustration). These 3 motions combined take only ten hundredths of a minute.

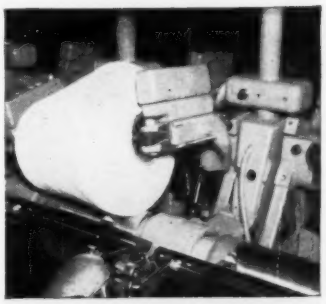
WHAT ABOUT QUALITY? The quality of Model 506 steep taper cones is even better than the quality of Model 102 cones (standard for the sales yarn market for many years). This quality results, not only from operator controlled knot tying, but also from an improved polydyne traverse cam, a larger diameter drive roll, compensating electronic tensions, new extremely efficient slub catchers, fool-proof cone size indicator and oil mist lubrication.

WHAT ABOUT SAVINGS? The purpose of automation, of course, is to save money. How much does the Model 506 save? The Model 506 runs at speeds from 900 to 1000 yards per minute — about twice as fast as manual winders — and increases an operator's productivity at least 50%. These figures are not theoretical. They have been substantiated and documented in mill tests, under production conditions.

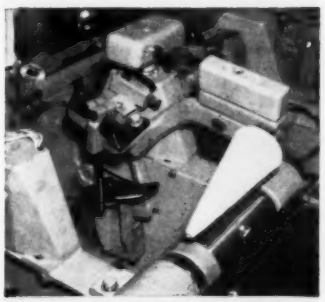
NOW AVAILABLE Early orders for the Model 506 are already scheduled for shipment starting Sept., 1961. There is still time to order machines for delivery later this year.



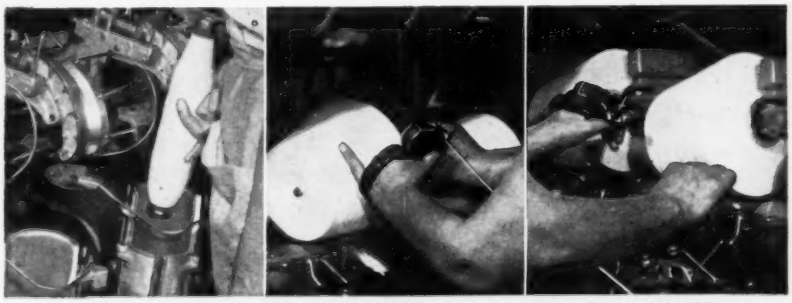
ELECTRONIC TENSION & IMPROVED SLUB CATCHER



FOOLPROOF CONE SIZE INDICATOR



REDESIGNED YOKE & ALUMINUM BALL BEARING CONE HOLDER

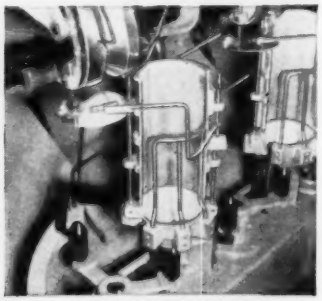


MANUAL OPERATIONS WHICH TAKE ONLY 10/100ths OF A MINUTE

DROPPING BOBBIN IN CHUTE

TYING KNOT WITH HIGH SPEED INSTRUMENT AND TESTING — ALL WITH LEFT HAND

RESTARTING SPINDLE WITH RIGHT HAND

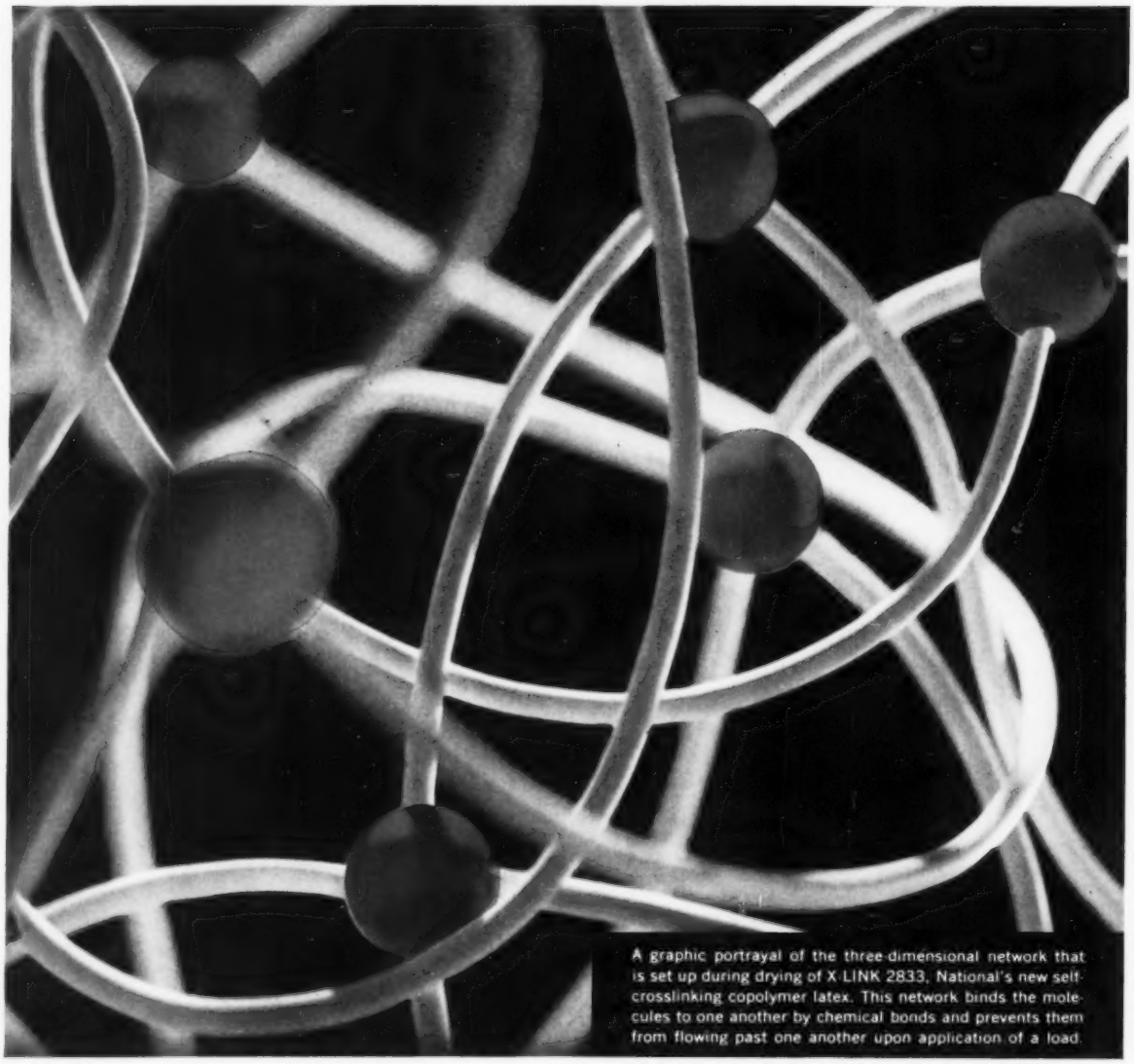


AUTOMATIC SUPPLY BOBBIN EXCHANGER

A Yarn Winder for Every Purpose

SOUTHERN BRANCH—Route 85, Belmont, N. C. • CANADIAN REPRESENTATIVE—Ross Whitehead & Co., Ltd., 2015 Mountain St., Montreal, Que. and 100 Dixie Plaza, Port Credit, Ontario • EUROPEAN REPRESENTATIVE—Muschamp Textile Machinery (Sales) Limited, Eider Works, Wellington Road, Ashton-under-Lyne, Lancashire, England

NEW SELF-CROSSLINKING COPOLYMER LATEX



A graphic portrayal of the three-dimensional network that is set up during drying of X-LINK 2833, National's new self-crosslinking copolymer latex. This network binds the molecules to one another by chemical bonds and prevents them from flowing past one another upon application of a load.

major improvement in water, solvent and heat resistance

Time again to take a fresh look at vinyl and acrylic properties. National's new X-LINK 2833—a self-crosslinking vinyl-acrylic copolymer latex—substantially improves water, solvent and heat or creep resistance. It also improves film strength. It broadens the scope of practical applications for vinyls and acrylics.

X-LINK 2833 is self-reactive. It crosslinks rapidly upon drying without the addition of thermosetting resins. Eliminates problems of limited stability, odor, compatibility and high curing temperatures usually associated with formulated products.

X-LINK 2833 is suggested for nonwoven binders, wallpaper coverings, asbestos beater addition, paper saturation, vinyl organosol tie coats, adhesive uses, awning coatings, pulp molded products and specialty coatings for textiles and paper. Write for complete technical information.

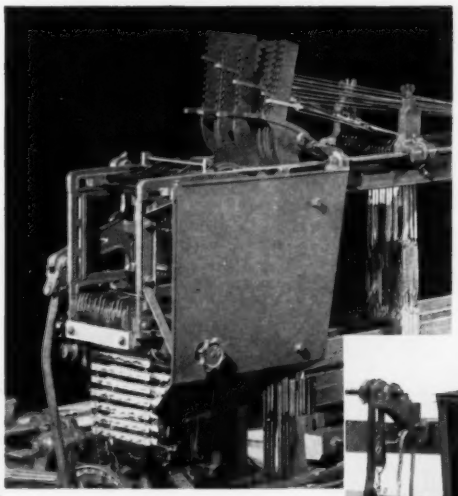
National RESINS

NATIONAL STARCH and CHEMICAL CORPORATION

750 Third Avenue, New York 17 • 87 Haynes St., N.W., Atlanta • 53 Fargo St., Boston

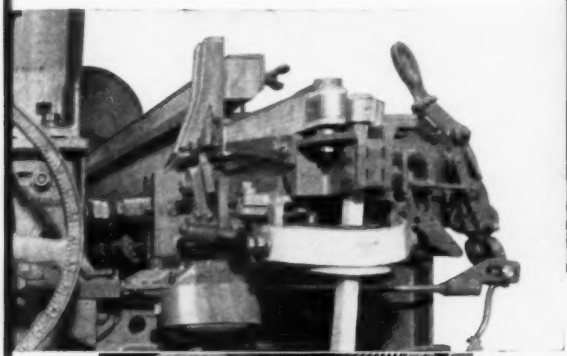
For further information use Handy Return Card, Page 149

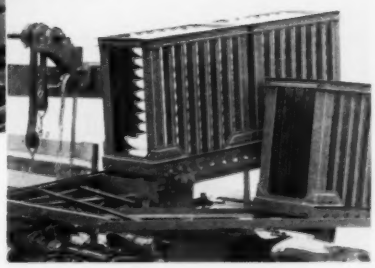
X-3 a new dimension in weaving



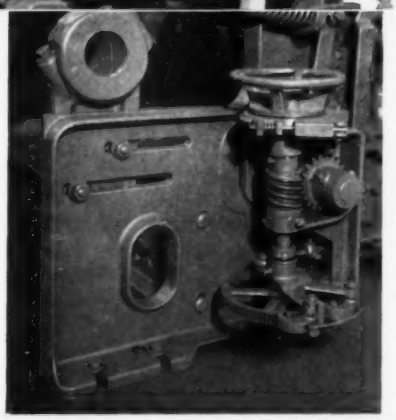
TOP MOTION
New strengthened Dobby
— 16 harnesses, 15/32 Gauge
— 20 harnesses, 3/8 Gauge
Clock Spring up to 6 harness

ALUMINUM OR WOODEN LAY CONSTRUCTION





AUTOMATIC FILLING MAGAZINE



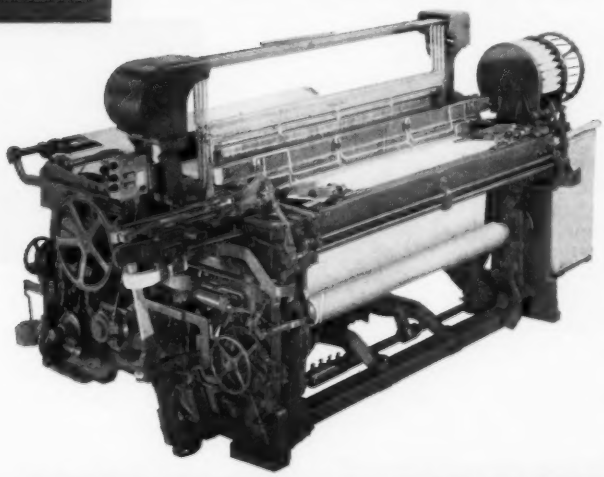
The X-3 Model Loom is designed to weave all of the fabrics normally woven on the X-2 and most synthetic fabrics commonly woven on the XD. This loom provides *greater versatility, increased speed, higher quality goods, and lower weave room costs.*

A weight increase of over 500 pounds in frame and shafting*, contributes to added stability, reduces vibration, and permits higher speeds regardless of fabric being woven.

**As compared with a Draper X-2 Model Loom*

IMPROVED TAKE-UPS
to weave a complete range of Cotton and Synthetic fabrics.

LET - OFFS
Bartlett
Tru-Tension
Hunt



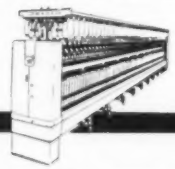
D DRAPER CORPORATION

HOPEDALE, MASS. • ATLANTA, GA. • GREENSBORO, N. C. • SPARTANBURG, S. C.

MORE OF WHITIN

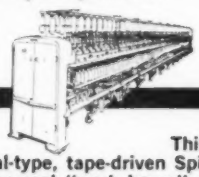
Whitin builds, in addition to the Model N (shown opposite), other models of Spinning Frames for Cotton and for Wool, Worsted and blends as well.

PIEDMONT Model K Spinning



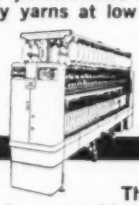
Introduced as "the most advanced Spinning Frame in the world!" 27" wide, it is unsurpassed for the high speed production of top quality yarns of cotton or spun synthetics.

WHITIN SUPERFLEX Spinning



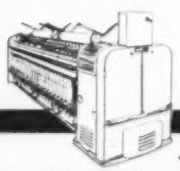
This 39" conventional-type, tape-driven Spinning Frame is the real "work horse" of the industry with millions of spindles in operation. It has a solid reputation for dependable performance in producing high quality yarns at low cost.

PIEDMONT Model KW Spinning



The Piedmont Model KW is a combination of two great developments — the Whitin American System adapted to a Piedmont chassis. The finest frame available for spinning worsteds, long staple synthetics or blends of both.

FLEX-SPIN Wool Spinning



The new Flex-Spin Wool Spinning Frame makes available to woolen mills a frame providing maximum production, package size and performance. It features a 16" traverse, reciprocating ring and spindle rails and balloon control rings.

All these models are outstanding in their fields. All share in design and construction, those distinctive touches so unmistakably Whitin.

WHITIN

PERSONAL NOTES

(from page 38)

Cave, assistant treasurers, have been elected assistant vice-presidents. * * * **Lucius Delk** has been named manufacturing manager of dyeing and finishing at the Mooresville, N. C., plant.

W. F. Garth has become director of personnel for the cotton division of Pacolet Mfg. Co., New Holland, Ga. **David W. Johnston** has been named manager of plant No. 6.

James B. Griffin, general superintendent of Waverly Mills, Inc., Laurinburg, N. C., was recently named "Man of the Year" by the North Carolina State College chapter of Phi Psi.

Anthony Fantagone has been appointed manager of knitting mills for E. M. E. Mills, Inc., New York City, and **Steve Sinclair** has been named superintendent.

P. S. Smith, formerly assistant to the president, has been elected president of Globe Mills Co., Mount Holly, N. C., succeeding **C. S. Clegg,** who has resigned.

Charles W. McCrary, president of Acme-McCrary Corp., Asheboro, N. C., was recently elected chairman of the National Association of Hosiery Manufacturers. **Gordon Hanes,** president of Hanes Hosiery Mills Co., Winston-Salem, N. C., was named first vice-chairman, and **Alfred P. Slaner,** president of Kayser-Roth Hosiery Co., Inc., was elected second vice-chairman.

At the 96th annual meeting of the National Association of Wool Manufacturers held in New York City recently, **Edwin Wilkinson** was renamed president. Five vice-presidents were elected as follows: **Hugh G. Chatham,** Chatham Mfg. Co., Elkin, N. C.; **Roger M. Grimwade,** Charlton Woolen Co., Charlton City, Mass.; **Herbert Pleet,** Yorkshire Worsted Mills, Lenni Mills, Pa.; **Frederic W. Tipper,** Cascade Woolen Mill, Oakland, Me.; **Horace C. Weston,** Mayflower Worsted Co., Kingston, Mass.

Ray Taylor, superintendent of the Cateechee plant of Woodside Mills, has been elected president of the newly organized Pickens County Textile Club.

Lewis L. Bowen has been promoted to general superintendent of the four plants of Alice Manufacturing Co., Easley, S. C. * * * **Lowell Southerland** has been named superintendent of the Foster plant succeeding Mr. Bowen. * * * **Wallace C. Houston** has been named superintendent of the Elljean plant succeeding Sam G. Owens, who has been promoted to company engineer.

E. W. Walton, Jr., secretary and general manager of Walton Knitting Mills, Inc., Hickory, N. C., has been elected president of the Catawba Valley Hosiery Club. **T. R. Kramer,** vice-president of Kayser-Roth Hosiery Co., and general manager of the Duke division, has been elected vice-president.

W. F. Garth has been named director of personnel for the cotton division of Pacolet Manufacturing Co., New Holland, Ga. **David W. Johnston** has been appointed manager of plant No. 6.

At the annual banquet of Textile Technical Federation of Canada held in Montreal recently, **A. H. Miller,** Scholler Brothers, Ltd., was elected

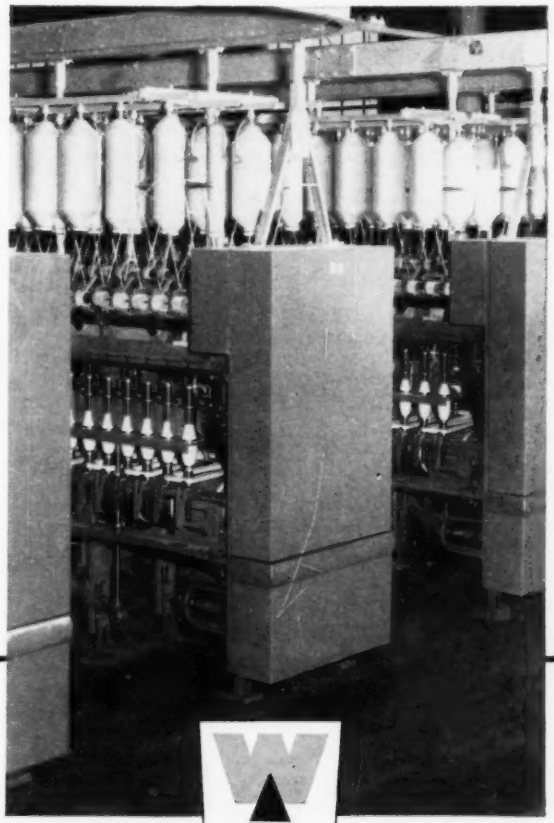
Continued on page 48

Fred Dent, vice-president and treasurer of Mayfair Mills, Arcadia, S. C., was recently elected an honorary member of the Clemson (S. C.) Chapter of Phi Psi, textile honor society. Pictured (left to right): Crawford Love, vice-president of the chapter, Mr. Dent; **Dean Gaston Gage** of the Clemson School of Textiles; and **C. E. Anderson,** a national vice-president of the society and plant manager of Lockhart (S.C.) Mfg. Co.

For further information use Handy Return Card, Page 149

". . . in cotton spinning, Whitin has built more of the spinning frames, currently in operation in the United States, than all other makers combined"

Millions of Whitin-built spindles are in production today — dramatic proof of Whitin's ability to build the kind of spinning the industry wants. As a case in point, consider our new Model N Spinning Frame. Its quick acceptance again spotlights Whitin's alertness to the needs of the modern spinner. Only Whitin, with century-long experience and unequalled facilities, could have produced such a frame. It's a functional spinning frame — cut trim and lean — a compact combination of essential features, many tempered by mill test — others, new as tomorrow — deftly coordinated into a tough, hard-to-beat frame — a frame designed to spin your yarn competitively.



Model N Spinning at WHITIN Texas Textile Mills, Inc.

But, best of all, the price is cut trim and lean to match! The Model N can help you keep "the competitive edge." Your Whitin Representative can tell you how. Why not call him today?

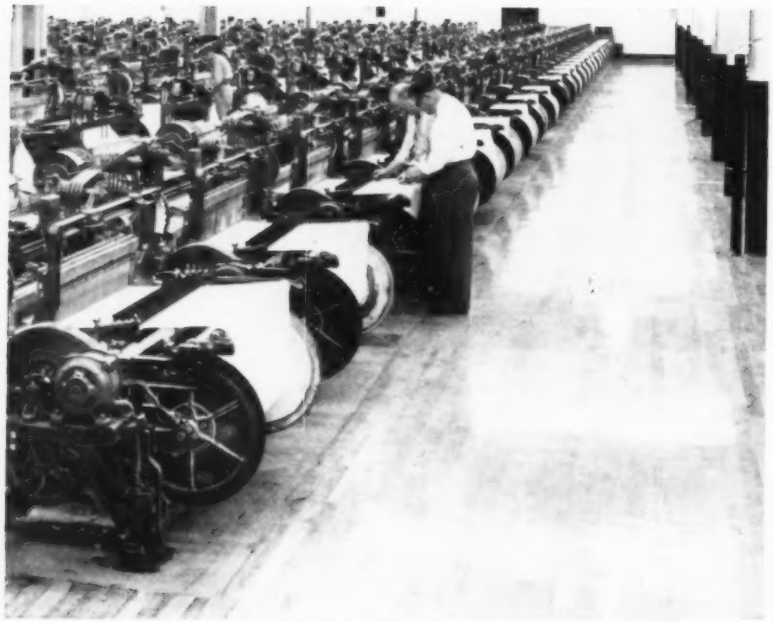
* Findings from a recent mill machinery facilities survey.

WHITIN machine works

WHITINSVILLE • MASSACHUSETTS

CHARLOTTE, N. C. • GREENSBORO, N. C. • ATLANTA, GA. • SPARTANBURG, S. C. • DEXTER, ME.

The best way to better yarns



TENNANT-SEALED weave room floors are bright, dirt-resistant, easy to clean.

How your TENNANT Floor Specialist helps you

save ⅓ in floor care costs

Would you like your mill to have floors as bright and clean and durable as this? And at an annual cost up to a third less than you're now paying?

Your TENNANT Floor Specialist *can show you how.*

Makes floors dirt resistant. He can demonstrate, for example, the exclusive TENNANT SYSTEM process that actually makes your floors up to 3 times more resistant to dirt. And when they *do* soil, dirt wipes off easily in a fraction of the usual time.

Seal lasts twice as long. Your TENNANT Man will also demonstrate heavy duty floor seals which are *unequalled for durability.* Since they end the need for frequent refinishing, you'll save many gallons of material each year.

Used in 1000 major mills. More than 1000 of America's leading mills are now saving money by using the complete TENNANT SYSTEM of floor care. And most are following an *individualized* program which their TENNANT Man developed to fit their specific needs in each department.

WRITE TODAY *for an analysis of your floor care problem. You may be surprised at the saving you can make.* G. H. Tennant Co., 735H No. Lilac Drive, Minneapolis 22, Minnesota.

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The Textile Industry's Most Widely Used

FLOOR MAINTENANCE SYSTEM

Methods

Machines

Materials

FLOOR MAINTENANCE SYSTEMS

PERSONAL NOTES

(from page 46)

president. **S. H. Chambers,** The Montreal Cottons, Ltd., Valleyfield, Que., and **J. M. Nodtvedt,** Chemcell Fibres, Ltd., Montreal, were named vice-presidents.

Arthur N. Richman, president of Art-Rich Mfg. Co., was recently e-

lected president of the Tufted Textile Manufacturers Association.

Jacob A. Goldfarb, president and chairman of the board of Union Underwear Co., has been named "Man of the Year" by Kappa Tau Beta, fraternity of knitting technology and science in the School of Textiles at North Carolina State College.

C. E. Sytz has accepted the position of general manager of Glenoit Mills. Mr. Sytz will serve as superintendent of the Tarboro, N. C., plant.

OBITUARIES

John S. Abney, 40, president and treasurer of Abney Mills, Greenwood, S. C.

Malcolm P. Decker, 69, treasurer of Triangle Prints Co., West Warwick, R. I.

Alfred J. de Gozzaldi, 69, chairman of the board of Roxbury Carpet Co., Saxonville, Mass.

Henry Grill, 63, vice-president of Waldensian Hosiery Mills and president of the Francis-Louise Full-Fashion Mills, Valdese, N. C.

R. T. LeGrand, 81, chairman of the board of Shelby (N. C.) Cotton Mills, Inc.

Hector A. McCulloch, 59, superintendent of dyeing at Clifton Yarn Mills, Clifton Heights, Pa.

George Gerard Murray, 34, secretary-treasurer of Domil, Ltd., subsidiary of Dominion Textile Co., Ltd., Montreal, Canada.

Howard Madison Wade, 84, founder of Wade Manufacturing Co., Charlotte, N. C.

Earl Green Wilson, 69, retired operator of Wilson Hosiery Mill, Haw River, N. C.

For further information use Handy Return Card, Page 149

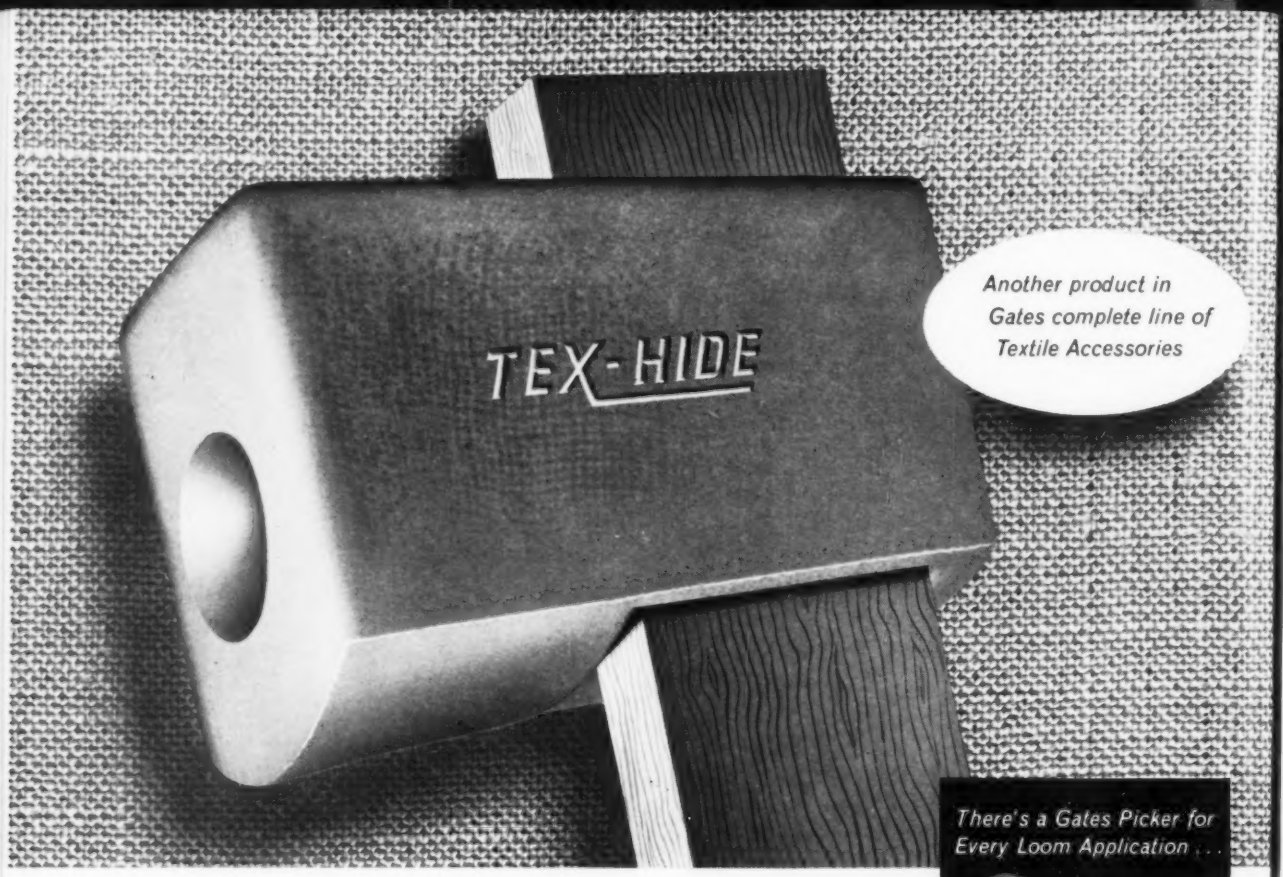
NOT A SPOT—THANKS TO MILLCOT®!

MILLCOT anti-spatter oils prove their worth at inspection time — in yards and yards of spotless production. By clinging closely to fast-moving parts, they reduce oil stains on fabric to a minimum. Millcot "K" grades are tacky to prevent excessive drip and to reduce oil consumption on looms and other textile machinery. Millcot DX, an ideal top-roll bearing oil, is not stringy and does not form "threads" which may stain yarn during oiling. Effective anti-wear agents maintain lubrication under heavy pressure and shock loading in looms.

NEBULA® EP multi-use grease replaces many single-purpose lubricants. It does an outstanding job in the hot, heavily loaded bearings of slasher, dryer, and calender rolls; provides extreme-pressure protection for loom gears and bearings.

Esso Sales Service Laboratories are always ready to help solve your lubrication problems. Call your experienced Esso Representative, or write to us at 15 West 51st Street, New York 19, New York.

ESSO STANDARD, DIVISION OF
HUMBLE OIL & REFINING COMPANY



Another product in Gates complete line of Textile Accessories

Smoother loom operation makes Gates Tex-Hide Loop Pickers No. 1 choice of leading mills*

Gates Tex-Hide is a super-tough, highly resilient material that assures you of exceptionally long service life for loop pickers. Gates Tex-Hide provides all the shock-absorbing capacity and resilience of leather . . . better than any other material, natural or synthetic.

These Loop Pickers catch the shuttle without bounce, preventing filling thread from breaking or sluffing off the bobbin. They run cool, rapidly dissipating the heat generated in catching and throwing the shuttle.

As a result, Gates Tex-Hide Loop Pickers assure smooth loom operation over a long period. They help maintain the highest quality of cloth, and greatly reduce your down-time costs.

For better, faster, more economical production, equip your looms with Gates complete line of textile accessories. Contact your nearby Gates Textile Distributor.

**Names supplied upon request.*

The Gates Rubber Company, Denver, Colorado BP47
Gates Rubber of Canada Ltd., Brantford, Ontario

There's a Gates Picker for Every Loom Application . . .

SUPER VULCO PICKER
Newest addition to Gates line of pickers. Pale pink color. Excellent for intermediate applications requiring both economy and durability.

VULCO PICKER—*Molded of rubberized fabric . . . low cost. Designed for use in weaving cottons and specialty-type fabrics where low initial picker cost outweighs all other factors.*

GATES TEXTILE ACCESSORIES

Gates — *Building the future on 50 years of progress*

Tex-Hide Harness Straps

Thin-Tex, Vulco, Tex-Hide and Super Tex-Hide Lug Straps

4-in-one Check Straps

Take-up Roll Coverings
Card Bands Cone and Evener Belts
Spinning Frame Drives

Eight bales make up the standard mix, and these are laid down in staggered order. Note partitions designed to restrict fire damage.

Staff prepared

Exclusive

SAVINGS in stock costs amount to more than the additional cost of cleaning in an opening and preblending system in operation at Carolina Mills, Maiden, N. C. Improved uniformity and better running work in the plants owned by this company don't cost anything as a result of the centralized preblending plant put into operation about a year ago, according to O. Leonard Moretz, president of this progressive mill organization. Among the benefits derived from the consolidated opening and blending operations are:

1. More consistent running conditions and more uniform product.

2. Greater latitude in selecting stock.

3. Lower stock cost.

In one instance, stock cost was reduced about 4% by using a lower grade of stock and doing better cleaning while meeting the same specifications on the yarn.

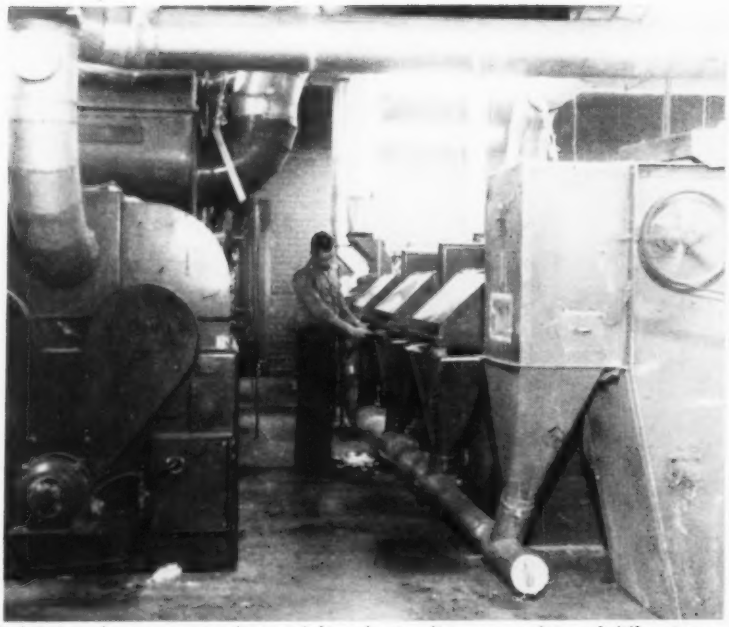
In another instance, a higher per cent of comber noils could be used because of the more thorough and accurate blending.

Heather yarns have been upgraded and improved (where viscose and cotton are used) for the

3 MILLS . . . 1 OPENING LINE

Improved quality and lower raw material cost are benefits cited by Carolina Mills for its one-year-old preblending plant serving the company's three spinning mills

Seven automatic weighing feeders are utilized on one of the two blending lines in Caroline Mills' centralized preblending plant.



Included in the two opening lines and four cleaning lines are machines of different types; hence, processing conditions can be varied to suit stock.

knitting outerwear trade.

There are three plants in the chain making carded yarns in counts ranging from 2.5s to 30s. The bulk of production is on 6s to 30s.

Most of the cotton bought here is M 1 1/16" and SLM 1". Other stocks are used as the product warrants. For example, a line of tinged yarns is carried.

There is one plant in Lincolnton, two in Newton, and one in Maiden, N. C. Three of the four plants make carded sales yarns; the fourth makes canton flannel.

A large part of yarns is delivered to customers in company-owned trucks, and in order to consolidate loadings of trucks, all yarns are shipped from a central warehouse located at Maiden. When trucks go to plants to pick up yarns, they deliver a supply of preblended cotton from the plant at Maiden where all preblending is done for the several mills.

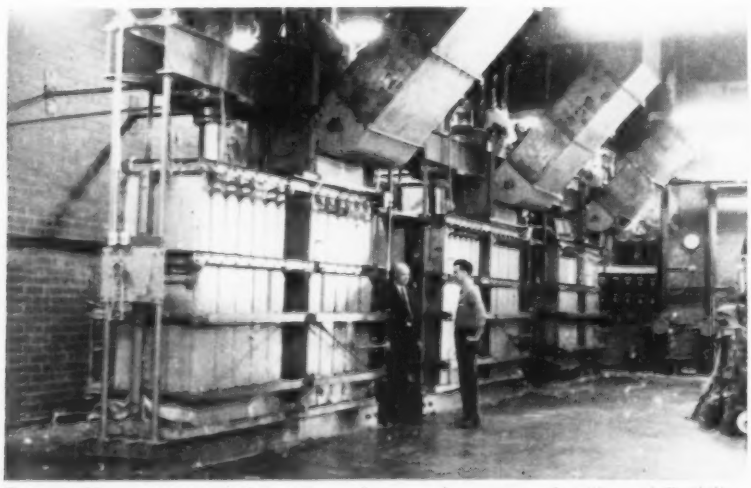
Formerly, each plant did its own opening, cleaning, and blending. But a search for areas of improvement indicated that different equipment (and ideas as to proper cleaning and blending) existed at the various plants. Each of the four spinning units had a separate opening room to supply the individual requirements.

The idea was conceived to locate all cleaning and blending at one place and to use more elaborate cleaning equipment to do a better and a more uniform job. One big advantage of a single large opening room lies in the big floor area which is needed to lay down enough bales for a good mix.

Proper supervision of blending and cleaning operations is important and often difficult—management realizes that oftentimes the least competent help is used to supervise and operate the opening and blending operations.

In this instance uniform results are achieved in such volume that good supervision is more than justified. The superintendent of blending operations has foremen who supervise the operations on two shifts, and they serve as fixers for minor repairs and/or adjustments.

Machinery used in the opening, cleaning, and preblending plant includes enclosed blending feeder hoppers with Pepper - Shakers attached on one line of opening and No. 15 openers on another.



Three double-compartment baling presses take care of present needs with good flexibility.

Each line of cleaning is supplied by three of the blending hoppers, and there are four lines of cleaning. These four lines feed into one baling press.

Reworkable waste is run into one hopper. The blending hoppers feed into a No. 11 condenser over a No. 12 lattice opener. This stock in turn is picked up by a blending hopper and fed into a jet air cleaner. Two of the lines have AxiFlo cleaners and two have Superior cleaners.

Having precleaned cotton (before blending with viscose) helps make a cleaner product and precludes loss of any rayon which would result if cleaning were done after blending.

In the same cleaning room, there are two blending lines. One consists of five weighing hoppers feeding onto aprons to Superior cleaners to a baling press (for one line). Another line has weighing hoppers for adding various other fibers to a mix. An SRRL opener is added to give more intimate blending for lower grade mixes.

When synthetics are run on this blending line, the SRRL opener is bypassed.

Storage facilities on the grounds take care of 3000 bales of unblended stock, and two warehouse rooms hold a total of about 1200 bales of blended stock readily available and easily accessible.

Two basic styles of cotton are run through these lines. To provide for complete flexibility, some of both stocks are kept open on the floor at all times. 48 bales are kept on the floor, but only 24 bales of each kind are blended at one time. Mixes are made up in eight-bale units, making a staggered opening when new bales are laid down.

When bales are taken to a plant to be spun, only four bales are opened at a time but these represent portions of about 96 bales because they do not come from the same mix; there are at least 25 numbers separating each of the four bales (making a total of 100 bales difference). Every blended bale is numbered in sequence.

Loom maintenance, shuttles discussed by N.C. mill men

Staff report

Left to right: GILBERT MAYS, Erwin Mills, Inc., Durham, N.C., new Division chairman; R. M. McCRARY, B. I. Cotton Mills, Tarboro, N.C., STA president; and T. B. STEVENS, Erwin Mills, Inc., Erwin, N.C., outgoing chairman of the Division.

■ THE EASTERN Carolina Division of the Southern Textile Association met at Durham, N. C., recently and held informal group discussions on carding, spinning, and weaving topics. *W. T. Wiley*, Erwin Mills, Inc., Durham, led the group on weaving.

Erwin Mills' Wiley

Several mill men indicated no specialized loom upkeep was practiced in their plants. One speaker said that each loom maintenance man has 68 looms to repair and adjust, and these operations are performed at warp-out. Cloth defects are reported two or three times each shift so that corrections can be kept current. On warps that run one to two months, looms are lubricated between warp-outs.

Three looms on each section are worked over thoroughly each week in addition to minor adjustments and lubrication upon warp-out. One man attends to lubrication, usually. Fixers have a check list which serves as a record of offending looms, and these records are checked regularly by supervisors.

Shuttles of bonded construction averaged 5,000-6,000 hours of service in one plant. Another reported 8,000-10,000 hours service for similar shuttles. Shuttles made of plastic gave 6,000-7,000 hours of service in another instance where 21s to 40s filling was used. Two to three nylon tension loops were used in these shuttles for satisfactory results.

One spokesman indicated that five tension loops were used on two different numbers (23s and 38s filling) in his plant. A combination of fur and bristle worked well on denims to prevent streaks from occurring at filling change, another mill man stated.

If two loops of nylon are used, one at the front of the shuttle and one at the back of the shuttle, both set at a 45-degree angle, satisfactory tension is obtained when using a No. 108 eye, one man concluded.

Gilbert C. Mays, Erwin Mills, Durham, was elected chairman of the division. Elected to the executive committee were *Richard M. Mitchell*, manager, Cone Mills Corp., Tabardrey Plant, Haw River, N. C.; and *Charles G. Buie, Jr.*, general manager, Aileen Mills Co., Biscoe, N. C.

Capitalize on the employee's desire to get ahead by encouraging him to learn another job in his spare time and using him on it when possible. For example, let doffers learn to fix so they will be available for emergency service or promotion.

Train 2 for every job

How to keep the work force effective regardless of who is absent

by Carl West
Exclusive

THE FIRST-LINE supervisor, with his many duties and responsibilities, is especially busy at the beginning of the work shift. At this time he must check to see that all jobs are filled, assign new employees, replace absentees, see that reports and requisitions are made for the day's needs, and take over the job with as little confusion and loss of production as possible.

Few things can be more frustrating to a supervisor at the beginning of the shift than to find that a key man is absent without advance notice and *there is no trained replacement.*

He must immediately get someone—usually from another job, which in turn must be filled—show the new man where the job is, how it should be run, and check him during the day. Not only does the supervisor have to neglect many of his duties, but the entire job often suffers because one man is absent and upsets the regular routine.

The supervisor can make the job easier for himself, for other employees, and add to the efficiency of the department if he will do some advance training and build a versatile work force. Here are examples of what can happen to a supervisor who is unprepared for an emergency and to one who is prepared:

Henry Tait, first-line weaving supervisor, received word that one of his loomfixers would not report for work. Henry borrowed an extra loomfixer from another unit of the department. But the spare fixer had no previous experience on the type of looms composing the section where he was needed.

Henry had to place this man on another section, take the regular fixer from this section and use him to replace the absent man. With both these men on strange jobs, Henry had to spend most of the day with them and neglect much of his routine.

Not only did Henry's job suffer because of the absence of one man,

but Henry created a grievance in juggling his work force. The loomfixer he transferred from his regular job resented being arbitrarily taken from his section, which the borrowed man had run indifferently. The fixer had to turn on extra effort to "catch up" when he did return to his home stand.

How Foresight Helped. In contrast to Henry Tait's dilemma, Spinning Supervisor Bob Watson stayed well out in front of the situation. One night Bob received a call home because of illness in his family. He had a single extra employee, a youngster who was learning to sweep and clean machinery, and he used him to replace one of the two regular sweepers. Together, the new team could keep the sweeping under control for awhile.

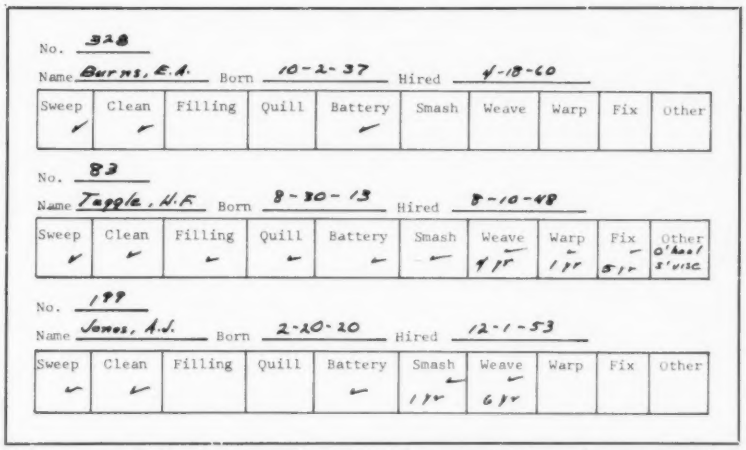
The sweeper Bob thus freed had learned to doff in his spare time, so Bob gave him a full doffing job, freeing a doffer who had learned enough fixing in his spare time to be of real help now. He gave the now spare doffer a fixing job. The fixer thus freed assumed Bob's duties, and Bob was at home with the family in no time at all. And his job did not suffer because of the emergency.

Naturally, some confusion, some disruption of the regular schedule resulted from a change in personnel. But advance training can smooth such changes.

Of course, one cannot foresee every disrupting absence, but one can be prepared for such. It is as simple as keeping the employees understudying the jobs around them. Each should be capable of taking over at least one other job, permanently or temporarily.

Use That Get-Ahead Desire. Almost everyone wants to get ahead, to have a better job, to make more money. And the supervisor can capitalize on these ambitions by encouraging the sweeper to learn to weave, spin, doff or run other jobs in his spare time. Use him on these jobs whenever possible.

Do the same thing on up the line. Let the doffer learn to fix and familiarize the fixer with the fine points of the foreman's routine. Help each employee learn all he can about the job ahead so that he can run it when the opportunity comes.



No. 328
Name Burns, E.A. Born 10-2-37 Hired 4-18-60

Sweep	Clean	Filling	Quill	Battery	Smash	Weave	Warp	Fix	Other
✓	✓			✓					

No. 83
Name Tuggle, H.F. Born 8-30-13 Hired 8-10-48

Sweep	Clean	Filling	Quill	Battery	Smash	Weave	Warp	Fix	Other
✓	✓	✓	✓	✓	✓	4 yr	1 yr	5 yr	Oiler/ Sweep

No. 199
Name Jones, A.J. Born 2-20-20 Hired 12-1-53

Sweep	Clean	Filling	Quill	Battery	Smash	Weave	Warp	Fix	Other
✓	✓			✓	1 yr	6 yr			

Such a record kept on each employee will help in placing him, planning promotions.

There are numerous ways to encourage a versatile work force. Exchange employees on various jobs whenever it can be done without causing confusion or creating a grievance. Encourage employees to learn other jobs by actual experience or by study. Practice upgrading in the department when possible. Always have one or more employees ready, able, and willing to step up to another job without time-consuming training.

Much on-the-job training can be done without neglecting jobs or increasing labor costs. Approached in the right way, most weavers, fixers, and other trained workers are glad to show the unskilled employee how to perform various tasks. In return, the learner helps the trained worker on his job and everyone benefits.

If the supervisor has a large work force it is a good idea to have a written record of each employee's capabilities and experience. By keeping such a record you can review it occasionally and, if a shortage appears in a certain category, you can remedy the situation by some special training.

The record can be kept in conjunction with other personnel data or a separate record can be arranged as illustrated.

Some supervisors don't like to encourage their employees to learn other jobs. They claim that it makes too many of them dissatisfied with their present job. This attitude may have some merit, but if the supervisor explains to the worker that his promotion depends not only on how well he is prepared for a better job but also on how well he runs the present one, he will have no trouble along this line.

There are supervisors too, who are afraid that a versatile and ambitious work force perils their own job security. Naturally, there are some who strive for the supervisory jobs. But if a supervisor is really capable there is only one way he can go—and that way is UP. If one of his subordinates gets his job, he gets a better one!

There have been many instances where a supervisor missed being promoted because he had no one ready to "step into his shoes." Management will often decide that it is better to hire a qualified man, or to train one for a job, rather than to train two men at once to fill one vacancy.

So the supervisor who really wants to get ahead, or who wants to make his present job easier, should encourage versatility and ambition. He should have an understudy for each job, including his own. The true worth of a supervisor is not shown by how much the job depends on his constant attention but by how well it can function when he is not there.

This study shows that overdrying and overcleaning cotton at the gin give the farmer a better grade, but at the expense of a less spinnable fiber

Who

TABLE 1. Ginning Conditions During Trials to Investigate the Effect of Drying Temperature and Lint Cleaners

Gin and Bale No.	Drying Temperature °F	Lint Cleaners	Moisture Content (Gin Stand) %
Gin A*			
Bale 9401	Dryer - 160 Mitchell Extractor - 110	None	7.00
Bale 9402	Dryer - 190 Mitchell Extractor - 110	None	3.50
Bale 9399	Dryer - 150 Mitchell Extractor - 125	1 Moss-Gordin	7.25
Bale 9400	Dryer - 185 Mitchell Extractor - 115	1 Moss-Gordin	3.50
Gin B**			
Bale 2720	1st Dryer Middle - 170 Bottom - 150 2nd Dryer Middle - 230 Bottom - 150	1 Battery-Type	7.00
Bale 2726	1st Dryer Middle - 290 Bottom - 220 2nd Dryer Middle - 265 Bottom - 185	1 Battery-Type	4.50
Bale 2889	1st Dryer Middle - 190 Bottom - 150 2nd Dryer Middle - 175 Bottom - 150	1 Lint Comber 1 Battery-Type 1 Moss-Gordin	5.50
Bale 2888	1st Dryer Middle - 290 Bottom - 235 2nd Dryer Middle - 245 Bottom - 200	I Lint Comber 1 Battery-Type 1 Moss-Gordin	2.75

* Gin A equipment—Separator, tower dryer, four-drum incline, six-drum Lummus Gridmaster, Mitchell extractor, Lummus double moting gin, Moss-Gordin lint cleaner, condenser, bale press.

**Gin B equipment—Separator, tower dryer, overhead cleaner, burr extractor, tower dryer, overhead cleaner, Mitchell extractor, Murray 90 gin, Murray combing lint cleaner, Murray battery-type combing lint cleaner, Moss-Gordin lint cleaner, condenser, bale press.

by William T. Waters and Joe Phillips
School of Textile Technology
Auburn University, Auburn, Ala.

Exclusive

THE PRESENT era of mechanization in the production and harvesting of cotton has led to the use of additional drying and cleaning equipment by the ginner in order to maintain higher grades and premiums for the farmer. Although these new ginning techniques result in a cleaner cotton with a smooth, feltlike appearance of greater eye appeal, many mill men have complained of poorer spinning quality and state that the higher grades do not accurately reflect the cotton's true spinning value.

The situation created is a difficult one, since the ginner would like to gin cotton of high quality for both the farmer and the mill, but economic pressure and the present system of grading make him use the new techniques to maintain grades and premiums for the farmer. Many mills have found that lower grades of cotton actually process better than higher grades which have been subjected to excessive drying and cleaning during ginning. Because of the importance of good processing performance to the mill, several larger mill companies have resorted to "custom ginning" in order to obtain cotton which has not been overginned.

The importance and interest of the mills on the subject of excessive drying and cleaning during ginning can be seen by the numerous articles published in recent

killed cotton quality?

This Article in Brief

■ A SERIES OF TRIALS have been run at two gins to determine the effect of lint cleaning and drying on cotton quality. A comparison was made in one gin of cotton subjected to no lint cleaning and one lint cleaning, with each being dried to 7% and 3% moisture content using a maximum drying temperature of 190 F. In the other gin one and three lint cleaners were used, and the lint dried to 7% and 3% moisture content using a maximum drying temperature of 290 F.

The use of lint cleaners and the drying of cotton to 3% moisture content during ginning was found to improve cotton grade but to adversely affect cotton length properties such as upper quartile length, mean length, length variability, and short fiber content. This detrimental effect on fiber length in turn resulted in an increase in product unevenness and a decrease in spinnable limit, spinning performance, yarn strength, and yarn appearance grade.

In general, the effects due to one lint cleaner and a drying temperature of 190 F were not appreciable, while the effects of three cleaners and a drying temperature of 290 F were very significant. The effects of lint cleaning and excessive drying temperature were found to be more noticeable in spinnable limit and yarn strength than in other properties.

years (see references at the end of the paper). From a review of the literature on previous work, the following conclusions are indicated:

1. The use of lint cleaners and the reduction of lint moisture to a critical point by excessive drying during ginning substantially improve the grade of cotton, because of less foreign matter and a smoother, feltlike appearance (3, 7, 8, 19, 20)*.

2. Heat degradation reduces fiber strength and elongation at break by creating or intensifying weak points along the fiber (17).

3. Excessive drying and cleaning (lint cleaners) can reduce fiber length and substantially increase short fiber content. This in turn adversely affects spinning and weaving performance and yarn and fabric quality. The extent of this loss in quality is dependent upon the severity of drying and cleaning (3, 7, 8, 10, 13, 15, 18, 19, 20, 21).

4. Although a higher grade and premium may be obtained by excessive drying and cleaning, actual bale values may be lower due to the additional waste removed and the loss in moisture. The magnitude of this effect will vary with the grade of cotton (9, 19, 21).

5. Pin or pepper trash and seedcoat fragments are prevalent in the higher-grade cottons and difficult to remove during processing (3). This type of trash is believed due to the severity and type of new ginning techniques.

6. In general the above trends have been found; however, in two instances (18, 21) trends were found to reverse in which excessive drying produced a greater amount of short fibers and lower yarn strength but better spinning performance.

In addition to the above work on cotton quality and performance in the mill, it has been found by the Stanford Research Institute that individual fibers tend to twist into permanent convolutions at drying temperature above 266 F (23). This phenomenon would tend to increase fiber breakage by mechanical beating both at the gin and in the mill. It was also found that with increases in temperature the apparent amount of wax decreases or changes in character and the fiber thereafter takes on water more readily.

Although there has been an abundance of work on overdrying and overcleaning of cotton during ginning, there appear to be several points which have not been consistently nor adequately established. One point is whether the major damage is caused by overdrying, overcleaning, or the extreme when both occur. From the inconsistency of results from some of the work, it also appears that the spinning procedure used for evaluation may be so designed that differences are not pronounced or do not appreciably occur due to the specific spindle speed, yarn twist, or yarn size used.

Because of the importance of cotton quality to the textile industry, a project was designed to further collaborate findings of previous ginning studies by investigating the effect of several combinations of drying and cleaning upon selected fiber properties, spinning performance, and yarn quality. It should be kept in mind

*Numbers in parentheses are references at the end of the article.

TABLE 2. Fiber Properties of Raw Stock in Ginning Trial

	Gin A				Gin B			
Bale No.	9401	9402	9399	9400	2720	2726	2889	2888
Temperature	Low	High	Low	High	Low	High	Low	High
Moisture Content	7.00	3.50	7.25	3.50	7.00	4.50	5.50	2.75
Cleaners	0	0	1	1	1	1	3	3
Classification								
Grade	LM**	LM**	SLM**	SLM**	SLM	SLM, Br	SLM, Br	M
Staple (in.)	1	15/16	31/32	15/16	1	1	31/32	15/16
Micronaire Reading	4.3	4.4	4.3	4.3	3.7	3.8	4.3	4.8
Fiber Length								
a. Suter-Webb:								
UQL (in.)	1.06	1.01	1.08	1.03	1.04	1.00	1.01	0.94
ML (in.)	0.82	0.77	0.83	0.78	0.80	0.76	0.79	0.69
CV (%)	38	43	40	43	38	41	38	44
Short Fiber Content (%)								
½" and shorter	16.3	21.4	18.6	21.2	18.1	22.4	18.2	26.5
⅜" and shorter	12.2	15.7	14.3	15.4	12.8	15.1	12.8	19.2
b. Fibrograph (Servo)								
UHM (in.)	0.97	0.96	0.97	0.95	0.99	0.96	0.94	0.90
ML (in.)	0.69	0.69	0.70	0.68	0.73	0.73	0.68	0.66
UR (%)	71	72	72	72	74	76	72	73
Short Fiber Index (%)	15.0	16.7	14.5	14.6	13.3	13.6	15.4	17.7
c. Fibrograph (Digital)*								
Fibers ½" and shorter, (%)	9.3	10.2	11.5	12.2	7.5	11.2	12.3	18.2
Pressley Strength								
0" gauge (psi)	81.0	79.5	79.4	82.1	83.7	86.4	82.2	80.7
⅛" gauge (PI)	2.82	2.89	2.84	2.79	3.40	3.38	3.14	3.04
Moisture Content (%)								
Hart	8.3	8.3	8.0	7.7	8.5	8.3	8.1	8.2
Brabender	7.1	6.1	6.5	6.4	8.1	7.3	7.4	6.1
Shirley Analyzer Trash Content (%)								
Total Waste	4.6	4.9	4.9	3.5	7.1	5.9	5.7	5.2
Pepper Waste	1.3	0.6	0.8	0.3	0.8	0.5	0.3	0.2

* Data obtained from Charles Dean, Russell Manufacturing Co. ** Light Spotted

that the low moisture (high temperature) trials at Gin B are extreme and not common in the Alabama area. It is the purpose of this work to determine if excessive drying is detrimental to quality and therefore an extreme drying temperature was used.

Experimental Method. The trials were designed to show the effect of drying temperature and lint cleaners on cotton quality. Two gins, one representing a rather mild operation and the other a more elaborate setup, were used in these trials. Ginning conditions during these trials are given in *Table 1*. The cotton used in Gin A was hand picked and obtained from the same field. Due to installation of a new and third lint cleaner in Gin B, this trial was run in two steps, approximately one week apart, with the cotton mechanically picked at two different times.

Dryer temperature was regulated by measuring moisture content with a Hart Moisture Meter on the feed side (seed cotton) of the gin. For the effect of drying temperature, moisture levels of 7% (high) and 3% (low) were sought. The effect of three, one, and no saw-tooth-type combing lint cleaners was achieved by the bypassing of appropriate cleaners. Approximately one bale of cotton was ginned under each condition.

About 200 pounds of raw cotton were processed in each of two independent replicates under similar conditions and conventional equipment into 1.00-hank (600 tex) roving and 2.00-hank (300 tex) roving for each sample or ginning condition. Evaluation of spinning performance consisted of a conventional ends down test (approximately 2 to 3,000 spindle hours per replicate) on a Whitin Piedmont frame and an accelerated spinning potential test (4) on a Roberts frame. All processing was carried out at a constant relative humidity of 58%. In addition to spinning performance, each sample was spun into 20/1 (30 tex) and 30/1 (20 tex) yarn for measurement of yarn properties.

Tests were made on raw stock, sliver, roving, and yarn at standard conditions of 70 F ± 2°, and 65% rh ± 2%. Fiber tests were made on both raw stock and

TABLE 3. Fiber Properties of Finisher Drawing Sliver in Ginning Trial

	Gin A				Gin B			
Bale No.	9401	9402	9399	9400	2720	2726	2889	2888
Temperature	Low	High	Low	High	Low	High	Low	High
Moisture Content	7.00	3.50	7.25	3.50	7.00	4.50	5.50	2.75
Cleaners	0	0	1	1	1	1	3	3
Micronaire Reading	4.5	4.5	4.4	4.4	3.9	3.8	4.5	4.7
Fiber Length								
a. Suter Webb								
UQL (in.)	1.02	1.03	1.03	1.00	1.05	1.01	1.02	0.95
ML (in.)	0.75	0.77	0.78	0.74	0.80	0.75	0.76	0.70
CV (%)	42	41	40	43	39	42	44	43
Short Fiber Content (%)								
1/2" and shorter	23.3	22.4	20.7	24.0	18.3	22.7	23.5	25.5
3/8" and shorter	16.3	14.8	14.9	16.9	12.5	16.3	17.5	18.2
b. Fibrograph (Servo)								
UHM (in.)	0.97	0.97	0.99	0.95	1.00	0.99	0.98	0.91
ML (in.)	0.73	0.71	0.74	0.70	0.78	0.75	0.73	0.68
UR (%)	75	73	75	74	78	76	74	75
Short Fiber Index (%)	15.0	14.4	12.7	14.9	10.6	13.0	15.3	14.9
Tensile Properties (1/8" Gauge)								
Pressley Index	2.94	2.89	2.90	2.99	3.39	3.29	3.22	3.04
Stelometer (gm/tex)	17.7	17.9	17.5	17.6	20.5	18.6	19.2	18.0
Stelometer Elongation (%)	7.7	7.9	8.1	8.0	9.5	9.7	9.8	9.5
Moisture Content (%)								
Hart	7.7	7.7	7.9	7.6	8.0	7.8	8.0	7.5
Brabender	6.3	6.4	6.2	6.0	6.3	6.0	6.1	5.8
Shirley Analyzer Trash Content (%)	3.6	3.2	3.5	3.7	2.6	2.6	2.5	2.3

finisher drawing sliver and consisted of classification, Micronaire reading, fiber length properties (Suter-Webb and Fibrograph), moisture content, Pressley strength, and Shirley Analyzer trash content. Evaluation of processing performance and quality consisted of measuring card web neps and evenness of drawing sliver, roving, and yarn. Evaluation of yarn quality consisted of evenness, skein and single strand strength, elongation at break, and yarn appearance grade. In addition, evaluation of dye affinity and performance in knit goods was made.

Results and discussion

Cotton Quality. The grade and staple obtained were disappointing, since a better quality of cotton had been expected. Excessive rains during this period caused some field damage and probably account for the lower grade and staple. However, since the majority of previous work on this subject was done on irrigated Western cotton of 1 1/16" M or better, it is believed that the lower grade and staple of these trials will be of importance.

The cotton was classed by three different classers, whose classing of samples varied slightly. The effect of cleaners and drying temperature on grade and staple can be seen in *Table 2*. The use of lint cleaners is seen to raise the grade one-half to one full grade and lower the staple approximately 1/32". Drying temperature was found to have a lesser effect on grade and about the same effect on staple. From the combined effect of both lint cleaners and drying temperature, an increase of one full grade and a lowering of 1/16" staple resulted.

A further comparison of the effect of these variables on cotton quality can be seen in *Tables 2* and *3* in which complete fiber properties of both raw stock and finisher drawing sliver are shown. The Gin B trials had to be done in two parts, and although the cotton came from the same field, it is seen that one lot was of different fineness. Although this does not allow a true comparison between all the trials of Gin B, the effect of temperature is still valid and a general comparison of cleaners can be made.

Measurement of fiber length properties by both the Suter-Webb and Fibrograph indicates that drying to a low moisture content with three cleaners has a very significant effect on classer's length, mean length, length ratio, and variation, and short-fiber

content of raw stock. The use of one cleaner appears to have no appreciable effect on length properties while the effect of temperature was found detrimental in both trials.

In Gin B trials, with three cleaners and the higher drying temperature, both the three cleaners and high drying temperature are seen to have an appreciable effect on length properties with drying temperature having a greater detrimental effect than cleaners. The high level of fibers ½" and shorter indicates that short-fiber content is not dependent entirely on ginning conditions but can be high due to growth environment, field damage, etc.

Summarizing, it appears that as the severity of ginning treatment increases, fiber length properties are adversely affected. Although the temperature used in Gin B is an extreme, it clearly points out that if an excessive drying temperature is used with three lint cleaners a definite lowering of staple length and an increase in short fiber content will result.

Strength properties within both trials were found to be similar in general; however, it appears that the last two bales of Gin B are slightly weaker. This difference is small but could lower yarn strength somewhat.

It has been said that excessive drying can cause a permanent change in moisture properties; however, no appreciable nor consistent differences were found. Raw stock samples were evaluated for dye affinity by a differential dyeing technique. No appreciable differences in dyeability were noted except for the two lower Micronaire reading bales which indicated slightly less dyeability. In view of these findings, it appears that the ginning variables investigated have no appreciable effect on moisture properties.

Trash content, as measured by the Shirley Analyzer, indicates that the use of lint cleaners and high drying temperatures reduces foreign matter. Pepper trash was also measured and showed a similar trend; however, this small-type trash is usually not noticed too much until it is in the yarn.

In general, similar trends were found in the fiber properties of drawing sliver as for raw stock with the exception of length properties, in which the differences between treatments were found to be smaller.

Processing and Spinning Performance. Comparison of processing and spinning performance between the various treatments is shown in *Table 4*. No difference in card web neps was found between samples. A trend of increasing unevenness with higher drying temperatures was noticed, with the effect of three cleaners and high drying temperature having a very significant effect on product evenness.

One of the primary objectives of these trials was to determine the effect of lint cleaning and excessive drying on spinning performance. In Gin A, which represents the milder cleaning and dryer temperature, it is seen that neither temperature nor the one cleaner

TABLE 4. Processing Performance of Samples in Ginning Trial

	Gin A				Gin B			
Bale No.	9401	9402	9399	9400	2720	2726	2889	2888
Temperature	Low	High	Low	High	Low	High	Low	High
Moisture Content	7.00	3.50	7.25	3.50	7.00	4.50	5.50	2.75
Cleaners	0	0	1	1	1	1	3	3
Neps/100 Sq in of Card Web*	5.0	5.0	5.0	5.0	5.1	5.0	5.1	5.0
Uster Evenness (% CV)								
a. Finisher Drawing sliver (50-gr)	5.4	5.6	5.3	5.6	4.8	5.3	5.1	6.2
b. Roving								
1.00 HR	—	—	—	—	9.0	8.9	9.5	10.4
2.00 HR	11.4	12.0	11.8	12.1	10.8	10.5	11.7	13.3
Spinnable Limit (Yarn No.)								
4560 ft/min**								
3.50 TM	—	—	—	—	45	38	30	9
4.00 TM	43.5	43.5	40.5	40.5	—	—	—	—
4.50 TM	—	—	—	—	61	58	52	37
6000 ft/min								
3.50 TM	—	—	—	—	30	12	***	***
4.00 TM	33.5	31.5	30.5	27.0	—	—	—	—
4.50 TM	—	—	—	—	52	46	41	24
Ends Down/1,000 Spindle Hr								
20/1 (4.50 TM)	56	54	44	61	20	30	30	150

* Metallic Clothing ** Traveler Speed *** Would not spin

had an appreciable effect on either spinnable limit or ends down. Spinnable limit is a measure of the spinning capabilities of a given cotton and as such is much more sensitive to differences in fiber properties due to the finer yarns being spun.

Difficulty was had in spinning Gin A cotton at a 3.50 TM; therefore, it was spun only at a 4.00 TM. Both spindle speed and twist will have a great effect on spinning performance as is shown in the spinnable limit data; however, the ends-down test was run only at an optimum twist of 4.50 TM and a traveler speed of 5200 ft/min, due to the amount of stock available. Higher spindle speeds and lower twist would have increased the ends down appreciably.

The cottons from Gin B were found to have greater differences in spinnable limit, as would be expected, because of the more severe cleaning and higher drying temperatures used. From the results, it is seen that both temperature and cleaners had a significant effect on the spinning capabilities of this cotton. In the case of ends down, no appreciable difference is seen between the treatments except in the extreme treatment (three cleaners and high temperature) which very significantly increased ends down. This represents an example in which the cottons have different spinning capabilities in regards to spindle speed, yarn twist, and yarn size, but under optimum conditions (speed, twist, and count) the differences in spinning performance (ends down) are not appreciably greater except in extreme cases.

In recent years, considerable attention has been given to the measurement of short-fiber content and its effect on spinning performance. In cottons of similar length, a higher short-fiber content tends to lower spinning performance; however, the upper quartile length and mean length of cottons in general are likely the more important length properties. In the present trial, plots were made of length properties versus spinning performance. A definite relationship was found in which

TABLE 5. Yarn Properties of Samples in Ginning Trial

	Gin A				Gin B			
Bale No.	9401	9402	9399	9400	2720	2726	2889	2888
Temperature	Low	High	Low	High	Low	High	Low	High
Moisture Content	7.00	3.50	7.25	3.50	7.00	4.50	5.50	2.75
Cleaners	0	0	1	1	1	1	3	3
Uster Evenness (%CV)								
20/1 - 4.00 TM	25.2	23.9	24.3	25.0	—	—	—	—
4.50 TM	24.5	25.5	25.3	24.7	22.4	23.2	24.5	25.6
30/1 - 3.50 TM	—	—	—	—	22.0	23.9	25.5	—
4.00 TM	25.0	25.7	24.7	25.4	—	—	—	—
4.50 TM	—	—	—	—	23.3	24.5	25.3	27.8
Skein Break Factor (Lb x Count)								
20/1 - 4.00 TM	1623	1494	1540	1480	—	—	—	—
4.50 TM	1572	1560	1583	1545	2272	2109	1960	1636
30/1 - 3.50 TM	—	—	—	—	1691	1467	1306	—
4.00 TM	1434	1363	1448	1366	—	—	—	—
4.50 TM	—	—	—	—	2033	1928	1731	1509
Single Strand Break Factor (Oz x Count)								
20/1 - 4.00 TM	231	223	215	215	—	—	—	—
4.50 TM	234	226	235	223	287	274	258	220
30/1 - 3.50 TM	—	—	—	—	233	207	185	—
4.00 TM	196	194	190	194	—	—	—	—
4.50 TM	—	—	—	—	272	257	246	203
Single Strand Elongation at Break (%)								
20/1 - 4.00 TM	7.5	7.0	7.0	6.9	—	—	—	—
4.50 TM	7.8	7.5	7.6	7.3	7.8	7.2	7.0	6.3
30/1 - 3.50 TM	—	—	—	—	5.8	5.7	5.4	—
4.00 TM	5.7	5.6	5.7	5.6	—	—	—	—
4.50 TM	—	—	—	—	6.9	6.8	6.7	5.9
Yarn Appearance Grade								
20/1 - 4.00 TM	B	C+	C	C+	—	—	—	—
4.50 TM	B	C+	C+	B	B+	B	B	B
30/1 - 3.50 TM	—	—	—	—	B	C+	C+	—
4.00 TM	C+	C+	C+	C	—	—	—	—
4.50 TM	—	—	—	—	B	C+	C+	C+

the trend was curvilinear or as a certain critical length property was reached the spinning performance decreased at a very rapid rate. Due to the small number of points and the small differences between most (excepting the two extremes), these plots were not included.

Yarn Quality. The effect of various ginning conditions on yarn properties is shown in *Table 5*. It appears that the one cleaner and the drying temperatures used at Gin A have no appreciable effect on yarn evenness. However in the case of Gin B (more severe cleaning and drying), it is seen that both the three cleaners and the higher drying temperature increased yarn unevenness. This falls in line with the trends found in drawing and roving, and the increase in unevenness is likely due to the lowering of staple length and increase in length variability which tend to lessen fiber control during drafting.

Yarn strength (both skein and single strand) was found to be lowered in both gin trials by the use of cleaners and higher drying temperature with the effect greater in Gin B where a greater number of cleaners and a higher drying temperature were used. It is interesting to note that in the case of Gin A the ginning variables did not appreciably affect most properties evaluated but did lower yarn strength.

With the improved appearance and higher grade of the cottons ginned at the higher temperature using more cleaners, one might suspect that yarn of a better appearance would be spun. However, it is seen that the cleaners and drying temperature actually lowered yarn appearance by about one-half grade instead of improving it. This is largely due to the greater unevenness of the yarns.

Yarns from each ginning setup were knitted into underwear fabric by Russell Manufacturing Co. for evaluation. During knitting, no appreciable differences in performance were noted. The bleached fabrics were examined and all were found to have good hand and appearance and to be acceptable in quality. Samples 9400, 2889, and 2888 were found to be slightly more uneven in appearance as had been found in the yarn.

Conclusions. A series of ginning trials have been conducted to determine the effect of lint cleaners and excessive drying temperature on cotton and yarn quality. It should be stressed that the high drying temperatures used in Gin B trials are excessive and not generally used in the Alabama area. The results of this trial indicate the following conclusions:

1. The use of saw-tooth-type lint cleaners and the drying of cotton to moisture contents of approximately 3% during ginning result in an improved grade but lower cotton quality in terms of staple length, mean length, and variability of length (per cent CV and short fiber content). The magnitude of this effect is proportional to the severity of ginning in regard to number of cleaners and drying temperature. The use of three lint cleaners and a drying temperature of 290 F to lower lint moisture content to 3% resulted in an increase of one full grade and a lowering of 1/16" staple.

2. Due to the above adverse effects upon length properties, a general increase in product unevenness and a decrease in spinnable limit, spinning performance (ends down), yarn strength, and yarn appearance resulted.

3. In general the adverse effects due to one lint cleaner and a drying temperature of 190 F (Gin A) were not appreciable; however, the effects of three lint cleaners and a drying temperature of 290 F were significant.

4. It appears that the adverse effects of excessive cleaning and excessive drying during ginning on cotton quality in the mill are shown most in the lowering of spinnable limit and yarn strength.

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ENDS DOWN and WOOL GRADE

Do you know how to measure the effect of wool grade on ends down in worsted spinning? Here's a mill-proved method, developed for every-day spinning-room use

THE RELATIONSHIP between the quality of the wool in a worsted sliver and the count to which this sliver can be successfully spun has been the subject of debate both in the trade and literature for generations.

It is common knowledge that finer quality spins to finer counts. However, the answer to such questions as how much improvement can be expected in spinning if the average diameter of the fibers present is reduced by one micron, usually meets with an evasive answer.

The work reported here shows how we developed equations and procedures extremely useful to us in answering this and similar questions.

The spinnability of a yarn was measured by the number of ends down encountered per thousand spindle hours. In actual mill check runs made to test the validity of the data presented, great care was taken to cancel out the many variables affecting these illusive figures. Some of these factors are moisture content of roving and of the room, temperature of room, individual operator, individual frame, oil content of roving (type and quantity), weight of roving, length of time roving had been conditioned before spinning, twist of roving, and finally the tensile strength of the roving.

The method of approach to obtain the desired answer lies through:

1. Relationship between count of yarn and its diameter.
2. Relationship between number of fibers present and the diameter.
3. Relationship between the distribution of fibers and the diameter.
4. The distribution of the number of fibers present in various cross sections of the same count.

Count vs Diameter. The relationship between count of the yarn (N) in worsted units and the diameter of the yarn (D) in inches is expressed by the equation

$$D^2 = \frac{1}{756\ N}$$

In terms of area this becomes

$$A = \frac{.00104}{N} \qquad \text{(Equation 1)}$$

where A is measured in square inches.

Count vs Number of Fibers. However, in order to develop from Equation 1 the expression relating K, the number of fibers present in the average cross section, to the worsted count (N), the cross-sectional area of the average fiber expressed in square inches must be determined:

$$\text{sq in. / fiber} = .786\ (.0000393\ d)^2$$

where (d) is the diameter of the fiber in microns and .0000393 is the number of inches in a micron. Then K, the number of fibers present in any thread, becomes

$$K = \frac{\text{Area in sq. in./ thread}}{\text{Area in sq in./ fiber}}$$

or

$$K = \frac{858{,}000}{d^2\ N} \qquad \text{(Equation 2)}$$

Table 1 shows the theoretical number of fibers present in yarns of various counts, the results of the application of Equation 2.

TABLE 1. Number of Fibers in Worsted Yarn Cross Sections

Worsted Count N	Avg Dia Microns d	Fibers/ X-Sect K
30	23.5	51.5
34	23.5	45.8
40	21.6	46.0

Diameter vs Fiber Distribution. At this point consideration must be given to the fact that the diameters of the fibers making up the various mean values differ widely, therefore Equation 3 must be developed to take this into consideration.

In any yarn cross section of N count the total area will be made up of the sum of the areas of the various diameter fibers:

$$A_1 = .786 d_1^2 n_1$$
$$A_2 = .786 d_2^2 n_2$$

and so on through

$$A_n = .786 d_n^2 n_n$$

The sum of these areas is equal to the area A of the yarn:

$$A_T = .786(d_1^2 n_1 + d_2^2 n_2 \ldots + d_n^2 n_n)$$

But the true number of fibers Q present in the cross section is

$$Q = n_1 + n_2 \ldots + n_n$$

If f_1, f_2 . . . f_n represent the frac-

TABLE 2. Distribution of Fibers from Projecting Microscope

Midpoint d	d^2	f	d^2f
12.5	156	.024	3.74
17.5	306	.235	71.95
22.5	509	.414	210.85
27.5	760	.207	157.30
32.5	1056	.083	87.60
37.5	1412	.029	40.95
42.5	1815	.008	14.52
			586.91

Midpoint of 23.5 microns

TABLE 3. Fiber Distribution With Wider Variation

f	d^2f
.030	4.68
.215	65.80
.380	193.60
.207	157.30
.083	87.60
.065	91.80
.020	36.30
	637.08

The values for d and d^2 are the same as in *Table 2*.

tion of fibers of each class in a representative cross section, then

$f_1Q = n_1$
$f_2Q = n_2$

and so on through

$f_nQ = n_n$

Substitution of these values in the equation above gives

$$A_T = .786Q(d^2_1f_1 + d^2_2f_2 \ldots + d^2_nn_n)$$

Using the necessary conversion units and solving for Q:

$$Q = \frac{A_T(25{,}400)^2}{\text{The sum of } d^2f} \qquad \text{(Equation 3)}$$

where A_T is the area of the yarn in square inches and d is the diameter of the fiber in microns.

Variations in Diameter. Accumulated data tabulating the number of fibers present in randomly selected cross sections indicates that such data are normally distributed.

A total of 98 random cross sections of yarn spun to 30s worsted count and composed of wools with average diameters varying from 23.1 microns to 24.2 microns were investigated. The data so obtained were classified and the mean and standard deviation obtained. In each case the number of fibers present was determined by projecting the image of the cross section with a projecting microscope and physically counting the fibers present.

The mean number of fibers in a yarn cross section was found to be 45.6, and the standard deviation 10.8.

In another determination, using 52 cross sections of a 34s yarn spun from 23.5-micron wool, the mean number of fibers in a cross section was found to be 40, with a standard deviation of 10.9.

Table 2 is the actual distribution of fibers as obtained from the projecting microscope grade determination data. A_T for a 30s yarn is .0000347, as obtained from Equation 1. Substituting these values in Equation 3, Q is found to be 48.6 fibers. This is less than 51.5, the number obtained on the assumption that all the fibers present had a constant cross section of 23.5 microns.

Table 3 gives the effect on Q when the distribution of fibers around the mean is spread wider than in *Table 2*. Again using Equation 3, Q is found to be 44.7 fibers.

This indicates that the number of fibers in a cross section is inversely proportional to the square of the diameter and also highly dependent on the distribution of diameters making up the average. The number of fibers as calculated from these equations represents the mean number present in the yarn, but it is certain that since the yarn is not uniform in diameter the number of fibers present in any random cross section will vary.

Consideration of these data reveals that although the mean number of fibers present varies with the count of the yarn, the standard deviation of the number of fibers in individual cross sections of the two counts tested was almost identical. It is felt that *the standard deviation is dependent not on the count of the yarn but on the quality of the wool being used.*

Fiber Number vs End Breaks. The Pacific evenness tester was utilized to determine the minimum number of fibers necessary to maintain the continuity of the thread. In order to obtain these data a study of the charts obtained from a series of tests was undertaken.

The first step was to determine the relationship existing between

About the Author

■ EDWIN G. SUTCLIFFE has for 27 years been chief chemical engineer for Samuel Hird & Sons, Inc., Garfield, N. J., where he is in charge of wool scouring, dyeing, quality control, and statistical testing development from raw wool to finished fabric. He is a graduate of Newark College of Engineering, with a Ch.E. and B.S. and M.S. in Chemical Engineering.

Among his original developments are a grease recovery system for soap and soda and nonionic scouring; low-cost methods of dyeing wool-Dacron, methods of processing Orlon, Creslan, Kodel, and other fibers; and many new methods of approach to physical testing of textiles.

This article by Mr. Sutcliffe is the first of a series dealing with worsted spinning, dyeing, and finishing which will appear in TEXTILE INDUSTRIES.

TABLE 4. Spaces from Paper Zero of Various Yarn Counts

N	Spaces from Zero
19.5	+15.2
10.0	+50.4
33.0	0
42.0	— 4.7
70.0	—11.6
110.0	—15.35

+ indicates to right of zero, facing chart.
— indicates to left of zero, facing chart.

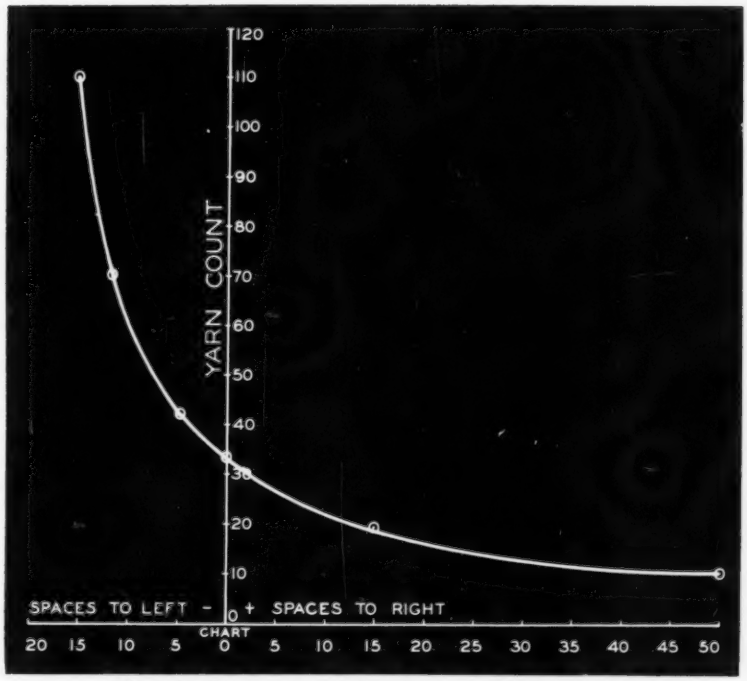


FIG. 1. Pacific eveness tester chart spaces vs worsted yarn count.

the number of space divisions of any instantaneous point on the trace and the equivalent count represented by this point. In this connection it must be remembered that the chart zero is some set measurement of depth in the groove.

The calculations were made under these constant conditions:

1. Yarn head of Pacific tester.
2. Chart zero equal to .0035 inches.
3. Yarn run in groove 2, which has a width of .009 inches.
4. A magnification of 470 for the distances the tracing pen moves.
5. One paper division = .075 inches.

The formula for the relationship between h, the height of thread in the groove, and the count of yarn was derived and is:

$$h = \frac{.1154}{N} \qquad \text{(Equation 4)}$$

This formula is independent of the magnification used.

The next step undertaken was to develop the relationship between count and the number of paper divisions from the paper zero that the mean of a specified count will occupy. This was found to be

$$S = \frac{21.93(33 - N)}{N} \qquad \text{(Equation 5)}$$

Table 4 and the curve in *Figure 1* were plotted using Equation 5. It must be remembered that this curve holds only when the factors previously listed are held constant at the values stated.

To test the validity of the curve in *Figure 1*, a series of yarns was run under the same set of constants. The mean value of each trace was determined in space units:

Yarn Count	Space Units
31.5	-1.0
19.5	-15.2

Both of these fall on the curve.

A similar test was made by modifying Equation 5 for 300 magnification and developing the equivalent curve. Five yarns were tested, and again the correlation was excellent.

The lowest points of 24 traces of 34s were checked, and found to be consistently at 15 spaces left of zero. The same value was obtained for 24 traces of 30s.

The yarn count at -15 was found to be 104s, using either Equation 5 or the curve in *Figure 1*. From Equation 2, the number of fibers in a cross section of 104s is found to be 15.

With the data derived in the foregoing, and remembering that a normal distribution for the number of fibers in a cross section is assumed, the probability of having less than the critical minimum of fibers in a cross section can be determined. For example, in the case of a 30s yarn from 23.5-micron cotton, with a distribution as shown earlier the chance of having 15 or fewer fibers is 0.3% (calculated from the normal distribution and normal tables). For 34s, the chance is 1.1%.

Comparing the two, it is obvious that *about four times as many breaks can be expected when 34s are spun from the same stock as 30s.*

Application to a Mill Problem. The spinning department reported a very bad spin on a lot of 62s quality wool spinning to 36s worsted count. Ends-down were in the neighborhood of 360 per 1000 spindle hours. The question was, "What quality wool should be used on subsequent lots to lower the ends-down count to a normal value of 80 or less per 1000 spindle hours?"

The 62s quality in use had an average diameter of 24.1 microns. A trace run on the Pacific tester indicated that with the following settings

(1) Yarn head
(2) Chart zero, .0035 inches.
(3) Groove 2 (width, .009")
(4) Magnification, 470

the lowest point in space units observed was -13, or 13 to the left of center.

By use of Equation 5 the equiv-

alent count of the setting was determined to be 81.2s. And by use of Equation 2 the average number of fibers present in 81.2s was found to be 41.

From the standard deviation found previously, and using the normal distribution and tables, the chance of having 18 or fewer fibers is 1.7%. This must be reduced to

$$\frac{80}{360} \times 1.7 = 0.36\%$$

Working backwards, we find that there must be 47.2 fibers in an average cross section to give 0.36% chance of having the minimum number or fewer fibers present. Then, solving Equation 2 for d, a value of 22.5 microns is found.

So the answer to the ends-down riddle was an increase in the fineness of the top from 24.1 to 22.5 microns. This brought about a reduction in ends down from 360 to 80 per 1000 spindle hours.

In practical tests this approach has been substantiated many times. But it must be remembered that for true comparisons all factors mentioned on the first page of this article must be controlled.

● *Mill - proved techniques for worsted system spinning and dyeing and finishing of Dacron/wool blends are described in Mr. Sutcliffe's next article which is to appear in the August issue.—The Editors.*

1960 woven goods output 4.4% below 10-year average

■ PRODUCTION of woven textiles of cotton, man-made fiber, wool, and silk in the United States in 1960 totaled 12,022,970,000 linear yards, down 3.2 per cent or 391,508,000 from the revised 1959 output of 12,414,478,000, according to the accompanying "Ten Years of Broad Woven Fabrics" chart issued recently by The Association of Cotton Textile Merchants of New York. The figure was 557,842,000 linear yards or 4.4 per cent less than the 1950-59 ten-year average production of 12,580,812,000.

Woven textile production was at an unusually low point for the year due primarily to curtailments in the last half, and with the exception of 1958 was the lowest of the decade. Otherwise, in the 20-year history of this particular statistical series, only 1949, when United States population was 31 million less than in 1960, and the closing war years of 1944 to 1946 when the nation numbered 41 million fewer consumers, showed less production of cloth.

Production per caput of population for 1960 set a new low mark of 66.55 *yards* against 70.04 for 1959, 66.81 for 1958, and 76.93, the ten-year average.

Continued on page 82

TEN YEARS OF BROAD WOVEN FABRICS

Data on annual production of broad woven fabrics assembled by The Association of Cotton Textile Merchants of New York from reports of the Bureau of the Census on cotton broad woven goods, man-made fiber broad woven goods, and woolen and worsted woven goods. Data for 1960 are from preliminary Census reports. Note that production is in linear yards (except tire fabric and cord reported in pounds).

	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
					THOUSANDS OF LINEAR YARDS					PRELIMINARY
COTTON BROAD WOVEN GOODS (except tire fabrics) TOTAL PRODUCTION	10,135,969	9,514,732	10,205,037	9,890,948	10,171,062	10,317,071	9,533,764	8,973,704	9,604,678	9,328,279
Duck and allied fabrics	362,777	366,081	263,223	239,819	242,087	255,471	219,692	200,212	223,462	204,575
Sheeting and allied coarse and medium yarn fabrics	2,836,253	2,416,939	2,356,855	2,493,582	2,585,636	2,668,090	2,507,770	2,310,774	2,600,701	2,482,295
Print cloth yarn fabrics	3,709,429	3,638,293	3,956,483	4,039,169	3,967,718	3,888,122	3,736,448	3,339,005	3,382,849	3,306,789
Colored yarn fabrics	779,053	827,362	862,816	738,617	698,691	625,328	533,051	484,951	519,731	455,270
Fine cotton fabrics	1,233,133	1,112,721	1,307,928	1,244,336	1,376,513	1,517,982	1,357,102	1,453,437	1,608,680	1,661,039
Napped fabrics, blankets, blanketing	408,682	297,790	290,316	233,143	240,600	240,844	209,203	195,750	205,870	205,196
Towels, toweling and dish cloths	421,607	428,358	475,086	455,088	502,298	562,638	540,739	534,849	571,626	547,829
Other woven cotton fabrics, specialties	385,035	427,188	490,330	447,194	557,499	558,596	429,662	454,726	491,759	465,286
RAYON AND ACETATE BROAD WOVEN FABRICS, TOTAL	2,083,836	1,851,673	1,903,233	1,730,904	1,928,162	1,626,047	1,463,894	1,654,120	1,618,403	1,428,044
100 per cent filament rayon and/or acetate fabrics	1,296,967	986,702	1,051,844	848,310	887,373	790,113	691,188	697,372	666,537	636,119
100 per cent spun rayon and/or acetate fabrics	407,601	407,273	442,129	445,485	528,185	351,474	281,820	419,714	308,941	215,069
Combination filament and spun rayon and/or acetate fabrics	190,238	227,074	138,594	118,876	109,184	107,776	107,192	121,811	121,437	103,284
Pile, upholstery, drapery, tapestry and tie fabrics	36,496	50,119	63,442	87,906	118,407	114,889	144,413	156,804	190,185	182,370
All other rayon and/or acetate mixtures including blanketing	152,534	180,505	207,224	230,327	285,013	261,795	239,281	258,219	331,303	292,202
OTHER MAN MADE FIBER FABRICS*	265,575	400,634	463,954	558,631	629,197	602,229	783,220	694,467	836,277	939,252
WOOLEN AND WORSTED WOVEN GOODS	375,400	351,359	335,914	284,231	317,586	324,358	294,490	271,340	310,831	283,295
SILK, PART SILK, OTHER FABRICS†	26,461	41,998	38,065	53,325	69,872	61,377	42,190	34,899	44,289	44,100
TOTAL PRODUCTION OF BROAD WOVEN GOODS (except tire cord and fabric)	12,887,241	12,160,396	12,944,203	12,518,039	13,115,879	12,931,082	12,117,558	11,628,530	12,414,478	12,022,970
					THOUSANDS OF POUNDS					
TIRE CORD AND FABRICS, TOTAL	603,913	530,980	521,007	418,338	524,354	449,093	448,700	387,065	469,634	418,439
Cotton tire cord and fabrics	289,160	139,001	73,216	59,890	68,261	51,419	42,251	37,520	39,633	29,957
Man-made tire cords and fabrics	314,753	391,979	447,791	358,448	456,093	397,674	406,419	349,545	430,001	388,482

*Incluides nylon, acrylic, polyester, saran, and polyethylene, and textile glass fiber fabrics and mixtures.
†Silk and silk mixtures only through 1953; includes paper yarn and miscellaneous as follows: 1954—10,917; 1955—27,165; 1956—20,296; 1957—14,265; 1958—13,456; 1959—15,640; 1960—15,650.

Carding Overseer Fred Hawkins checks sliver entering one of the 24" x 48" cans. Compare its size with the 14" x 42" can shown.

They use 24" x 48" cans!

With 80 lb of card sliver in a can, Sterling Cotton Mills realizes a 40% saving in labor

Staff prepared Exclusive

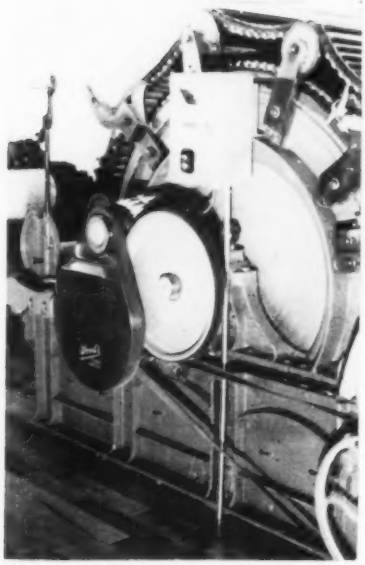
IN THE YEAR 1955, Sterling Cotton Mills, Inc., at Franklinton, N. C., put up 96 different yarn packages (all-cotton) ranging from 4s to 20s, single and plied, for every end use from sewing thread to warp yarns: today the firm produces only carded knitting yarns in counts from 24s to 30s. That year, Superintendent Lee F. McLemore began the equipment changes to produce the present yarns, and some of the changing is still going on.

The change to the simplified yarn schedules has upped plant efficiency (it is possible now to balance it), has helped in all operations, and has aided in inventory position. Where Middling 1" and SL 1" cottons were once used, Middling 1 1/16" now goes into the leisurely carded knitting yarns.

Machinery changes in the 19,200-spindle plant include new drawing, improved roving and spinning, and 22 additional cards. Furthermore, all cards now are fitted with metallic clothing, which saves 1 to 1½% on total waste. The firm hand-strips the cards over the idle weekends, and enjoys a measure of security in knowing the card room production can be upped an additional 30,000 pounds (over the present 75,000-pound output) if needed.

Clutchless individual card drives were selected because cards are started and stopped only on weekends, there being no week-day stripping cycle.

Cards are equipped with extraordinarily large coilers—they accommodate 24" x 48" sliver cans. Installation of these coilers, which were purchased from Southern States Equipment Corp., was start-



Clutchless drive performs well. Cards are stripped only over idle weekends.

First-shift drawing tender Tom Godfrey at one of the breaker drawing frame creels. Note that the 24" x 48" cans are not resting on the floor — they are on special trucks that hold four cans each.

ed last year and completed early this year. Preparatory to this, however, the cards had been stripped down to the floor, cleaned, repainted, and refurbished entirely to make them like new, including the metallic clothing and anti-friction comb boxes.

24" x 48" cans were selected for the cards to provide a package to cut down on handling of stock and to lower the number of piecings, thereby improving quality. Formerly, 14" x 42" cans were used.

About 80 pounds of sliver in each can before doffing permits a 75 per cent reduction in piecings and handling and a 40 per cent labor saving.

Upon changing to the larger cans and coilers, all cards were placed farther apart to make room for the larger cans and for convenience. Bays were changed from ten feet to twenty feet when new foundations and floors were installed in the recent building renovation preparatory to installing new card room equipment.

The present carding rate is eight pounds per hour compared to the 14 pounds per hour in 1955 when warp yarns were made, and carding capacity is now more than adequate. Benefits attributed to the change to larger coilers and cans are:

(1) 300% more stock handled at one time. Four cans are moved at once on special trucks, making a total of 320 pounds of stock on each truck.

(2) Four cans are creeled simultaneously at drawing instead of one as formerly, and cans never get off the truck or touch the floor.

(3) There is less trouble with tumbled stock, and the cans are more stable and better balanced, making less waste from tumbled stock and tipped cans.

(4) It is now easier to clean frames.

(5) Drawing efficiency has increased 12% in terms of hanks produced, and waste from creeling at drawing is reduced at least 50%. Tailings are all pieced in one can and then run through one delivery of drawing; there are two processes of drawing here.

Plans call for a lap conveyor to accommodate 80-pound laps which are to be produced by the pickers. Also, new drawing, to make best use of longer running package from cards, is to be installed.

Some problems were overcome in the transition. These included space requirements and layout of machinery but were expected because this was the first installation of card cans this size on cotton in the South. There have been no serious maintenance problems to date, and horsepower requirements were not adversely affected. 1½-hp motors are used on the cards with good results.

50-55% RH at 80-85 F is maintained as closely as possible in the card room for good running, and eight ends up on drawing make good work.

First-quarter man-made fiber imports down

■ IMPORTS of man-made fibers in March totaled 4,881,000 pounds, an increase of 7 per cent over the February level; however, total imports for the first quarter were only about half the amount imported in the first quarter of 1960, according to "Textile Organon," statistical bulletin of Textile Economics Bureau, Inc.

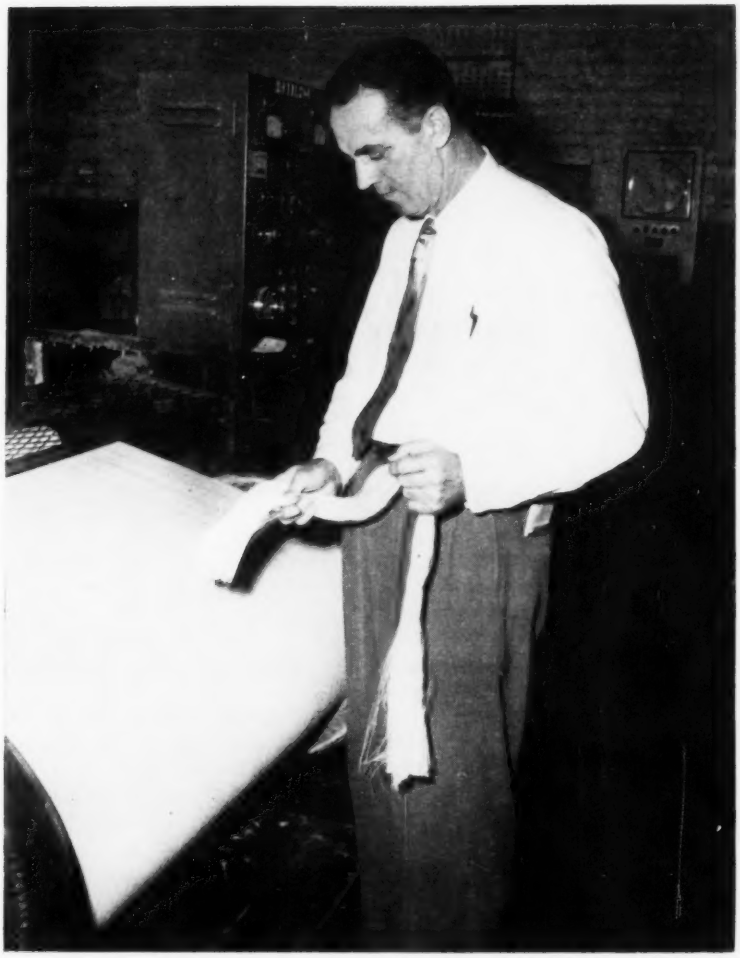
There was a major decline in rayon staple, and in this category the January-March 1961 imports were but 37 per cent of the first quarter 1960 figure.

The publication calls attention to a switch from lighter to heavier deniers in filament yarns; and in the matter of cellulosic waste, imports have more than doubled between the 1960 and 1961 first quarters.

An opposite trend is noted in the non-cellulosic fiber imports. Nylon staple imports were up 42 per cent, and other non-cellulosic staple showed gains of 150 per cent in the first quarter compared to a year ago, according to the report.

New-type size "cookers" improve pick-up

said Alabama mill men during their recent discussion of slashing and weaving problems



Staff report

PROMPTLY at 9:30 a.m. on April 29 Secretary-Treasurer *Cleveland Adams* called the Alabama Textile Operating Executives to order. The executives settled into their seats in Thach Auditorium, Auburn University, for their spring discussions of common slashing and weaving problems.

General Chairman *Lester Sayers* assumed command, briefed the assembly on the business of the day, and introduced *J. Harley Blankenship*, slashing discussion leader.

Size preparation, squeeze rolls, waste at slasher

Size Preparation. Starch converters or other size preparation systems present several advantages rather neatly summarized by *Mill Q*: more uniformity in viscosity and pick-up. Other plants mentioned the elimination of size storing, the equipment for such, and the thinning that stored size so often undergoes.

Only one plant, *Mill Q* again, reported using more than one type of size, and that firm merely switches on a dilution system that brings the size to the "cup" desired. *Mill M* has eliminated a size cooker on each shift, and *Mill I* reports that its size preparation unit makes size in about 1/5 the time the conventional equipment needed. And those two comments represent about the sum of "labor-saving" news the mills volunteered.

In starch costs alone, in substituting pearl for thin-boiling starches, four mills report a savings ranging from 42 cents per hundred pounds to 60 cents. Viscosity variation appears practically nil, as in no instance did a mill report having anything other than an improvement in that area.

Weaving efficiency improvement draws a brief "none" in three instances; in one instance a "not any difference."

Mill M instituted a change in weaver load at the time they installed the converter and thus obscured the cause for a rise in efficiency.

No one reported a reduction in weave room cost, and, with the ex-

New officers of the Alabama Textile Operating Executives are left to right: General Chairman—**W. N. Scroggins,** Opelika Manufacturing Co., Opelika; Vice-General Chairman—**Virgil Redden,** Tallassee Mills, Tallassee; Executive Committeeman—**R. L. Pyle,** Cowikee Mills, Union Springs; Executive Committeeman—**J. B. Forbus,** Bemis Brothers Bag Co., Talladega; Secretary-Treasurer—**Cleveland Adams,** Auburn University; and Executive Committeeman—**J. L. Lanier, Jr.,** West Point Manufacturing Co., Fairfax.

ception of *Mill M*, none has experienced an improvement in weaving seconds. In the single exception, the firm eliminated all seconds revolving about hard size.

Yarn shedding remains practically unchanged. *Mill Q* (with a paste compound) reports about the only change for the better. At *Mill M* the condition is "about the same."

The firms use size compounds in just about every form: all kinds; powdered; semipaste; paste; and liquid.

While *Mill Q's* representative was relating his firm's experience with the new system, there came this question from the floor:

"How do you control pick-up?"

"We adjust a control unit to meter the amount of water necessary to thin our size to the pick-up figure we want—8%, 10%, 12%, etc."

Incidentally, *Mill M's* spokesman had already touched on this with the statement: "We spin a dial to give us the pick-up we want."

Rubber-Covered Slasher Rolls. Performance characteristics and maintenance procedures on rubber-covered slasher squeeze rolls produced an animated discussion. While most of the data are given in *Table 1*, some of the exchanges taking place on the floor are of equal merit. Unfortunately, it is impossible to separate the questioner from the respondent.

Much of it, however, sprang from a remark dropped by a spokesman whose mill identity is lost: "We use two tandem size boxes when we run more than 2500 ends."

"What pressures do you use and what is the breaking point on the number of ends that determines if you use one or two size boxes?"

"5000, depending on the count. On the coarser numbers we break at 4000 ends, using two size boxes if we exceed that amount."

Someone remarked that his firm experienced more weaving shedding when rubber rolls softened, and that he was looking forward to talking shedding with someone using 0 fluidity against the 7 - 14 fluidities formerly used. No one could come to his aid.

TABLE 1
Rubber-Covered Squeeze Roll Operational Data

Mill	Slasher type	Yarn count	Roll wt. (lb)	Pressure psi	Pressure Wt equiv	Pick-up (%)	Single or double roll boxes?	Covering thickness (")	Overall dia (")	Length of longest roll (")	Buffing cycle	Buff your own?	Remarks
A	2-cyl	13.20s 20.25s	600	3	—	10	double	1.25	9.00	—	—	—	Has two 30" cans in front of slasher. Feels two squeeze rolls aid in stretch control.
B	2-cyl 7-can hot air	30.00s 40.00s	500	10	—	13 to 14.50	4 double 1 Griffin	1.50	8.50	60.00	3 mos	yes	Uses two-roll boxes when sheet has more than 3500 ends, otherwise pick-up is too light.
D	multican	14.00s	550	—	400	12	double	1.0625	8.25	57.50	6 mos	yes	——
E	multican	7.90s 15.00s	700 & 520	—	700	10	double	1.25 1.50	9.00	58.00	6 mos	yes	Buffs also as needed.
F	2-cyl	31.50s	549	20	660	12	single	1.75	10.00	60.00	3 mos	yes	——
I	2-head	14.70	600	10-60	—	11 to 12	double	2.00	7.00	63.00	as needed	yes	Modified Saco-Lowell slashers with West Point size boxes.
K	hot-air	34.50s	496		700f 540d	16	1-double 1-single	1.00	8.00	78.50	6 wk	yes	Double-roll size boxes give better dressing with more size pick-up.
L	multican & S-L	——	640	35	—	3.5 to 16	double	1.00	9.00	—	3 mos	yes	Buffing depends on running conditions.
M	7-can	10.00s to 40.00s	475	to 25	—	16	double	1.00	7.50	58.00	4 mos	yes	——
N	multican	3.50s to 23.00s	740 570	—	—	9 to 12	single	1.00	7.50	78.00	6 mos	yes	Finds it best to have longest rolls buffed commercially.
O	7-can	7.30s to 20.00s	550	45	—	3 pile 10 ground	single	1.00	7.50	59.50	4-6 mos	yes	——
P	multican	21.00s to 31.00s	465	35 to 50	—	13 to 17	single	1.00	7.50	60.00	3-6 mos	yes	Uses 20 psi roll pressure at creep speed, depending on formula and weave.
Q	multican	2.65s to 17.00s	550	—	500	—	double	1.50	8.50	69.50	as needed	yes	Double rolls give better cover, uniformity, penetration.
R	multican	12.00s to 20.00s	500	—	1000	10 to 14	double	1.00	7.50	62.00	see remarks	yes	Buffs when hardness reaches 50 durometer.
S	9-can	30.00s	500	19 f 20 b	—	12	double	1.00	7.50	63.00	see remarks	yes	Buffs when durometer reflects need.

One firm experiences more pick-up on colored yarn, although both colored and dyed yarns are dried before sizing. Responding to that cue, another representative stated that his firm has more shedding on the white goods. Still another firm, which does wet slashing, cannot tell much difference. The firm uses a special cylinder to partially dry a top sheet of yarn before it merges with a bottom sheet, a condition that would otherwise allow part of the size to migrate from the top sheet to the bottom one.

In one instance a firm expects a break increase of 30% to 35% after sizing. Came a voice from the audience. "We expect 40% increase from our 30s yarns." But neither spokesman gave such variables as grade and staple, twist, etc.

Some asked: "Has anyone experienced any trouble with the rubber hardening in the last inch before reaching the core?"

"Sometimes the base material will 'lump out' near the core."

"How thin can the last one inch of rubber be buffed without trouble?"

"3/8 inch" someone supplied.

"We buff ours to 1/4 inch," came another reply.

Someone asked a representative from *Mill Q* for that firm's method of maintaining roll hardness. His reply:

"We take periodic durometer checks and buff when the hardness approaches 65. We try to maintain it at 55, but 65 is our absolute upper limit."

Slasher Run-Out Waste. Slasher creels in use range from home-made three-tier units through old-style ball-bearing creels, with rollers for each beam, to conventional factory-built assemblies. Predominately ropes and weights or ropes and springs supply tension for the section beams, which range up to 38″ in diameter.

Each firm has a system of checking and recording slashing waste: *Mill I* weighs each slasher tender's waste and keeps the lots separated in locked boxes; *Mill K* records the soft yarn poundage from the section beams and uses the data to check run-out and variation between warpers and warper tenders. The firm also records the hard and soft waste resulting from a pull-over.

"How do you get the back beam to run out with the others?" asked someone, half in jest. A ripple of sympathetic laughter answered him.

White waste at *Mill M* runs about 1/10 of one per cent. The firm keeps and posts waste records to encourage a bit of competition among the slasher tenders. Running all beams of a set on the same warper aids materially; and management has found that running the slasher waste competition too far, running the waste down too closely, results in ends out in weaving.

While *Mill M's* representative had the floor, someone asked, "What is your hard waste figure?"

"Almost none."

"How do you pick your leases?"

"On the back before we pull the set through. We actually pick them as we load a mobile creel so we can wheel the creel into place and pull the set over with a minimum of slasher downtime. We lock lease combs in place and thread them through with the yarn."

"How many ends do you run per size box?"

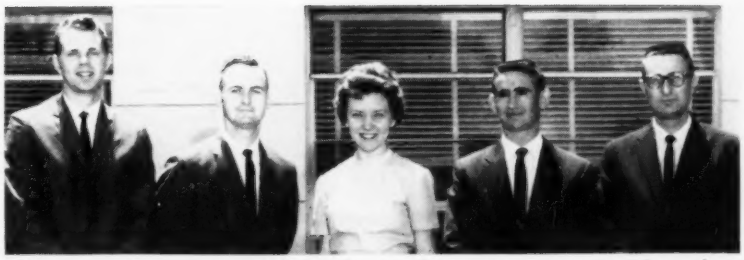
"We stop at 7500."

"What is your pick-up?"

"17 per cent."

Variation between beams at *Mill T* ranges from no waste on the front or first beam to 0.047% on the second beam, and increasing to 0.268% on the back beam, for a total variation of 28.82%. This is for a 12-beam set with the average being 0.094%. The waste figure mounts with an increase in beams, the average for a 19-beam set being 0.153.

Mill K averages 1.11 pounds of waste per beam with a range of 0.39 pounds to 2.64 pounds per beam. *Mill S*, on a set of seven 950-pound beams, averages seven pounds total waste with an average minimum of seven ounces and an average maximum per beam of three pounds.



Alabama operating executives had the pleasure of witnessing presentation of awards to outstanding students in the School of Textile Technology, Auburn University. Winners pictured here (l to r) are: **Bufrey Dean,** Alexander City, National Phi Psi Senior award; **Leroy Talley,** LaFayette, American Association of Textile Technologists award; **Judy Duke,** Sylacauga, Phi Psi Freshman scholarship award; **Billy Snell,** Ozark, Chattahoochee Valley Phi Psi Alumni award; and **Bill Morton,** Lindale, Ga., and Boaz, Northern Textile Association honor award. The other winners, not shown, are **Ed Eubanks,** Wetumpka, Alabama Textile Operating Executives award, and **Charles Maddox,** Childersburg, Textile Veterans Association honor award.

Loom upkeep, nylon in shuttles, plastic shuttles

Loom Supply Costs. See Table 2 for the loom supply costs, by loom model, of the reporting mills.

Sloughed Filling Prevention. The plants are almost evenly divided in the use of nylon loops as opposed to fur and bristles. Some use a combination of nylon and fur. But filling tension devices alone are not sufficient. As *Mill H* points out: "Our answer to controlling sloughed filling is to apply the correct tension while we are quilling or spinning, to apply the correct stroke and the proper layers per stroke, and to apply the correct amount of power. We

TABLE 2
Loom Supply Costs per 120 Hours

Mill	Loom model	Speed (ppm)	Width (")	Looms per section	Head loom fixer	Supply cost ($)	Remarks
B	E	163	40	90	no	1.49	
	C5	154	60	50	—	2.85	
	C7	174	60	51	—	—	
	XD	166	46	60	—	1.49	
C	X	172	40	100	no	2.14	
	X	172	44	100	—	—	
D	E	166	40	100	no	—	
	X-2	172	44	100	—	—	
E	X	175	32	72	no	1.17	Unifil-equipped E's, 75 per section; Unifil-equipped X-2's, 75.
	E	175	40	75	—	1.08	
	X	182	40	82	—	1.89	
	X-2	182	40	75	—	1.37	
F	E	174	44	104	no	1.32	
G	X	172	50	82	yes	1.48	Cost figure includes overhauling. Has fixer incentive system.
	X	182	40	84	—	2.04	
I	X-2	194	40	80	yes	2.86	
	L	182	22	86	—	2.34	
J	X-2	192	40	90	yes	2.80	Has fixer incentive system.
K	X-2	↑	40	60	—	2.93	Cost includes all loom models. Uses two overhaulers per shift, two breakdown men on first shift, on the 1256 looms.
	X-2		64	—	—	—	
	X-2		81	—	—	—	
	X-2		90	—	—	—	
	X-2	100	120	—	—	—	
	XP-2	to	82	—	—	—	
	XP-2	172	90	—	—	—	
	L	↓	64	66	—	—	
	L		81	66	—	—	
	L		90	66	—	—	
	L		99	66	—	—	
L	E	172	42	85	no	2.60	
	K	160	44	85	—	—	
M	E	160	50	vary	yes	1.50	
P	XL	120	82	73	no	2.01	
	XL	120	90	—	—	—	
	XL	102	120	—	—	—	
	X-2	168	50	71	—	2.13	
	X	180	40	82	—	2.63	
S	E	172	40	115	no	0.95	
	X	to	to	—	—	1.00	
	X-2	192	46	—	—	1.10	

install shuttle friction according to the yarn number."

Mill I's loom fixers go over their shuttles once per week, replacing all the worn fur and nylon loops. At the same time, the fixers make sure their looms are not using too much power and that the heel spring tension is sufficient. Insufficient tension there lets the picker dawdle, begin checking the shuttle before the boxes come into action.

Toward the close of the sloughed - filling discussion, someone touched off a couple of questions with: "Anybody tried nylon only to abandon it?"

"Our coarse numbers burned it so badly we abandoned it."

"We had the same trouble, so we changed back."

A representative from *Mill S* had finished his report when someone asked, "How do you insert the nylon?"

"By drilling with a jig to give us an approximate 45° angle from shuttle wall to quill."

"What is your quill length?"

"Eight inches."

"How much loop do you use?"

"Only enough to reach the quill between the first and second rings, counting from the tip."

"Spun or quilled yarn?"

"Spun."

"Do you have any burning trouble?"

"Our weekly inspections allow our fixers to get burned ones out before they give trouble."

"Is that your only friction device?"

"Yes."

"What is the life of the loops?"

"Four to five weeks."

This question was asked of no one in particular: "Is anyone using nylon loops on rayon filling?"

"We're using it on 400 rayon looms."

"What are your filling numbers?"

"8s to 20s."

Molded Shuttles. Mill men still stand somewhat divided on the issue of molded type shuttles vs. dogwood. But the sentiment, when all variables are weighed, definitely is in favor of the molded types. Among the advantages listed for the molded variety, one most often hears references to its dimensional stability under weave room humidities, its definitely greater wearing properties (three to four times that of dogwood), its freedom from splintering, and (this could start an argument) the ease with which it stays boxed.

Among the molded types, one mill man pointed out, is a laminated model that is somewhat lighter than its truly molded brother. Being lighter, it is naturally easier stopped. Consequently it gives less boxing troubles. He gave his cost per 1000 loom hours as $0.65 for the laminated against $1.00 for the dogwood.

As *Mill P* pointed out, more than mere running time enters into an evaluation of the two. But in every instance that firm finds the cost per 1000 loom hours less than for the dogwood variety, this despite using 74 per cent more check straps, 51 per cent more pickers, and an undetermined amount of box leather than the dogwoods demanded.

No one mentioned having evaluated parts wear brought on by tossing the heavier shuttles around. But among the remarks thrown out for all to hear are a few that pretty well summarize all that is really found wrong with the molded ones:

"Too much power. We have trouble keeping it down."

"Too many filling breaks . . . from bouncing."

"Couldn't hold it down."

"Fixers gotta fix looms — the looms can't use the shuttles without it."

by Norbert L. Enrick*

MODERN TEXTILE MANAGEMENT

Article 5—Using Evolutionary Operation to select the best processing conditions where there are many variables

Exclusive

SIMPLE procedures of Evolutionary Operation to establish the best processing set-ups, involving only a few simple variables, were described previously in these pages (TEXTILE INDUSTRIES, June, 1961, page 88). In the present article, simple procedures and worksheets are shown, which can be used for Evolutionary Operation when a multitude of variables are involved.

Spinning Investigation. An illustrative study is taken from a fine combed yarn mill, which had recently changed from double-creeled to single roving, and desired to establish the best settings for the new processing. The following three input variables were considered most important:

1. Hank roving size fed into spinning.
2. Twist multiple of the roving.
3. Break draft in spinning.

The variables representing the results, known as output variables, were:

1. Rate of ends-down per 1000 spindle hours.
2. Yarn unevenness in terms of Uster coefficient of variation.
3. Yarn strength, in the form of break factor and single-end strength.
4. Size variation coefficient from skein to skein in per cent.

Thus, with three input and four output variables, a total of seven variables were investigated. It turned out that the ends-down agreed in general terms with yarn unevenness, strength, and size variation. Therefore, to simplify the presentation, only the worksheets for ends-down are presented here. In actual practice, however, similar worksheets should be maintained simultaneously for each of the output variables.

Procedure. The general Evolutionary Operation (Evop) procedure is for the mill's Evop Committee to decide on the input and output variables to be investigated, to follow the progress of controlled experimentation with these variables during production, and to plan further investigations accordingly—always with the goal of achieving over-all optimums for quality, cost, and running conditions.

Each phase of Evolutionary Operation follows a distinct number of steps, as illustrated in *Table 1* for a four-variable program (one output, three input variables). For the spinning investigation, *Figure 1* shows the initial design of the study, while the worksheets in *Figures 2a-c* show the actual progress and results of each Phase of Operation. The entries in the worksheets are explained further by *Table 2*, showing the data in relation to the actual use.

In addition to ends-down, further worksheets were used to record quality characteristics (unevenness, strength, and size variation). In deciding on each phase of Evop study, the Evop Committee considered minimum quality standards for the yarn. In this particular example, since ends-down and general yarn quality are re-

*Associate Professor, University of Virginia Graduate School of Business Administration.

TABLE 1. Steps in a Four-Variables Evop Program

Step	Procedure
1.	Select three input variables and one output variable.
2.	Plan the trial processing set-ups in accord with a standard scheme, as illustrated in *Figure 1*, using the standard designations 1, a, b, etc., as indicated.
3.	Run a first Evop Cycle for each of the nine trial set-ups, recording the results in a worksheet, such as in *Figure 2*.
4.	Run two further Evop Cycles, making a total of three Cycles.
5.	Rank the test results for each Cycle, with the best test receiving the rank 1 and the poorest the rank 9.
6.	Obtain the first Rank Sums, by totaling the three rankings under each Set-Up.
7.	Compare the lowest Rank Sum against the Critical Rank Value. If the Sum is equal to (or less than) the Critical number, one may feel confident (at the 99 per cent level) that a significant improvement has been obtained, and the Phase is completed.
8.	If the lowest Rank Sum is higher than the Critical Rank Value, a further Cycle is run, and a new set of Rank Sums is obtained representing the total for each Set-Up of all Cycles. Again, the new lowest Rank Sum is compared against the corresponding Critical Rank Value.
9.	The procedures of Step 8 are continued until (I) the comparison of actual lowest Rank Sum with Critical Value indicates a significant improvement or (II) the sixth Cycle is obtained and still no significant improvement can be shown.
10.	If no significant improvement can be shown, it generally means that the current Phase of Evop investigation is not leading to any practically demonstrable improvements, thus suggesting that other processing variables be investigated in further Evop studies.

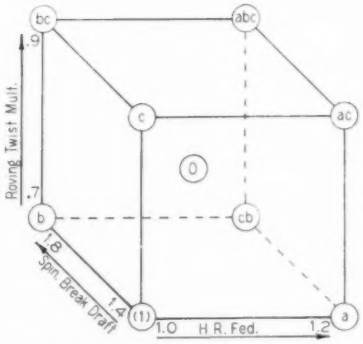


FIG. 1. Evop set-up used to find hank roving, roving twist, and spinning break draft combination for lowest spinning ends-down.

lated, there was no inconsistency in results. In particular, the processing set-ups which yielded the best running conditions in terms of low ends-down also entailed very acceptable yarn qualities. Where a conflict between quality, costs, and running conditions does occur, the Evop Committee will need to compromise between these opposing results—so that the final result will meet the over-all goals of the mill.

It will be noted that the mill accomplished a reduction in ends-down from 42.5 to 31 per 1000 spindle hours, by comparing the initial rate (average of Column "0," Phase 1) with the final lowest average (Column "1," Phase 3).

Meeting Individual Mill Problems. Among mills producing similar products, even identical yarns within a mill group, there are usually sufficient differences so that quality of product will differ. Moreover, adjustments and settings that will yield optimum processing in one mill are usually not those that will yield optimums in other mills. Thus, it is not possible to take the results from one mill and transfer them to another mill without a separate Evop study.

It should be emphasized that the data in the illustration in this article, while based on actual tests and experiments, would not be likely to yield optimum results in any specific mill. Each mill has its own Evop problems. Moreover, some adjustments have been made in the data for the purpose of slight simplification and at the same time concealing confidential information.

Acknowledgment

The author would like to acknowledge his indebtedness to Dr. Marvin Zelen, Associate Professor, University of Maryland, for permission to use the simplified ranking procedures for Evolutionary Operation and the Critical Rank Values as developed by him.

Dr. Zelen's values of critical rank sums, as used in the worksheets in this article, are based on statistically calculated 95 per cent confidence levels, which are the most frequently used confidence levels in mill studies of quality, waste, and production.

Evolutionary operation at Chemstrand

It is apparent that Evolutionary Operation has many applications, not only in the textile mill, but also in the chemical plant producing fibers for the mill and in the finishing plant processing the fabric.

A testimonial as to cost savings and general improvements in plant operation, resulting from the introduction of Evop in a chemical fibers plant, was given by F. S. Riordan, Jr., superintendent, intermediates process improvement, The Chemstrand Corp., Pensacola, Fla.

The results attained are such that no mill will wish to fail investigating the potential benefits of this new technique in their own operations, from raw stock through finished product.

Mr. Riordan's remarks are taken from a paper of his on "Evolutionary Operation," presented at the Gordon Research Conference on Statistics, August 24, 1959.

Evop Results. After roughly 15 or 16 months experience with Evop it is possible to make a fair appraisal of Evolutionary Operation. In our experience, Evop has made contributions which I classify under three headings: financial, technical, and personnel.

All managements, of course, evaluate programs or procedures from the financial viewpoint; the dollar is the common denominator of business and

EVOLUTIONARY OPERATION

Process: Spinning | Phase: 1 | Date: | By:

Study: Ends-down per 1000 Spindle Hours

Variables Studied	Processing Set-Ups								
	(1)	a	b	ab	c	ac	bc	abc	(0)
H.R. Fed	1.0	1.2	1.0	1.2	1.0	1.2	1.0	1.2	1.1
Spin. Br. Draft	1.4	1.4	1.8	1.8	1.4	1.4	1.8	1.8	1.6
Roving T.M.	0.7	0.7	0.7	0.7	0.9	0.9	0.9	0.9	0.8

	Cycle	Test Results								
	I	44	43	49	45	39	37	40	46	42
	II	41	38	50	49	36	37	48	39	43
	III	40	44	48	43	42	35	45	36	38
	IV	44	37	50	49	39	36	46	40	43
	V									
	VI									

Critical Rank Value		Ranking of Test Results								
	I	6	5	9	7	2	1	3	8	4
	II	5	3	9	8	1	2	7	4	6
	III	4	7	9	6	5	1	8	2	3
3	Sum	15	15	27	21	8	4	18	14	13
	IV	6	2	9	8	3	1	7	4	5
6	Sum	21	17	26	29	11	(4)	25	18	18
	V									
9	Sum									
	VI									
12	Sum									
Phase Optimum							✓			

FIG. 2a. Evop worksheet showing Phase 1 of the spinning study.

EVOLUTIONARY OPERATION

Process: Spinning | Phase: 2 | Date: | By:

Study: Ends-down per 1000 Spindle Hours

Variables Studied	Processing Set-Ups								
	(1)	a	b	ab	c	ac	bc	abc	(0)
H.R. Fed	1.1	1.3	1.1	1.3	1.1	1.3	1.1	1.3	1.2
Spin. Br. Draft	1.3	1.5	1.5	1.5	1.3	1.3	1.5	1.5	1.4
Roving T.M.	0.8	0.8	0.8	0.8	1.0	1.0	1.0	1.0	0.9

	Cycle	Test Results								
	I	46	38	47	43	44	30	39	40	42
	II	47	35	41	44	45	33	36	39	40
	III	50	42	45	51	44	33	35	41	40
	IV	47	38	44	42	46	34	40	41	42
	V	45	39	42	44	47	40	41	46	43
	VI									

Critical Rank Value		Ranking of Test Results								
	I	8	2	9	6	7	1	3	4	5
	II	9	1	6	7	8	3	2	4	5
	III	8	5	7	9	6	2	1	4	3
3	Sum	25	7	22	22	21	6	6	12	13
	IV	9	2	6	8	7	1	3	4	5
6	Sum	34	9	28	30	28	7	9	16	18
	V	7	1	4	6	9	2	3	8	5
9	Sum	41	10	32	36	37	(9)	12	24	23
	VI									
12	Sum									
Phase Optimum							✓			

FIG. 2b. Evop worksheet showing Phase 2 of the spinning study.

EVOLUTIONARY OPERATION

Process: Spinning | Phase: 3 | Date: | By:

Study: Ends-down per 1000 Spindle Hours

Variables Studied	Processing Set-Ups								
	(1)	a	b	ab	c	ac	bc	abc	(0)
H.R. Fed	1.4	1.2	1.4	1.2	1.4	1.2	1.4	1.2	1.3
Spin. Br. Draft	1.3	1.3	1.5	1.5	1.3	1.3	1.5	1.5	1.4
Roving T.M.	0.85	0.85	0.85	0.85	1.05	1.05	1.05	1.05	0.95

	Cycle	Test Results								
	I	32	37	34	42	34	38	40	43	35
	II	33	42	34	37	38	41	36	43	39
	III	30	34	39	40	35	37	38	41	46
	IV									
	V									
	VI									

Critical Rank Value		Ranking of Test Results								
	I	1	5	4	8	2	6	7	9	3
	II	1	8	2	4	5	7	3	9	6
	III	1	2	6	7	3	4	5	8	9
3	Sum	(3)	15	12	19	10	17	15	26	18
	IV									
6	Sum									
	V									
9	Sum									
	VI									
12	Sum									
Phase Optimum		✓								

FIG. 2c. Third phase of Evop spinning study, concluding this line of investigation.

industry. Evop is no exception—management will assuredly want to know how the results look in financial form. Here, of course, every company, every plant will have a different answer.

If the process is new and just getting into the production stage, then Evop will probably give rapid and dramatic results leading to large savings because the translation from research or development to the plant scale will not be exact. If the plant is a multi-process plant, making a tremendous variety of products, Evop has an excellent chance of making money simply because no company can afford detailed investigation of so many different processes.

On the other hand, Evop should not be expected to revolutionize processes which have been thoroughly researched; it may have some successes in these instances, but to expect Evop to have sensational results on such processes is unrealistic and unfair.

Our plant makes only four products; the processes are continuous and are the same ones that have been used for the past 15 years. There has been a great deal of research work done on the processes, but since most of it was not made available to Chemstrand except as summaries I cannot include this factor in characterizing our situation.

Financial Results. Using direct savings in raw materials as the financial measure, we have had programs which ran for long periods and saved only $10,000 per year; we have also been fortunate in having programs which saved upwards of $100,000 per year. Not all our saving has been in raw material—there have been programs where the capacity of the unit was increased, or the maintenance downtime lessened, etc.

We have also had programs where, so far, there have been no savings, but we have never yet had an Evop

TABLE 2. Example of Four-Variables Evop Program in Actual Use

Step	Procedure
1.	Input variables selected were Hank Roving Fed, Roving Twist, and Spinning Break Draft. Output variable was Ends-Down per 1,000 Spindle Hours. Other output variables, such as yarn strength, unevenness, etc., can be included if desired.
2.	The results of the first three Evop Cycles in terms of Ends Down observed and corresponding Rankings are shown in *Figure 2a*. The lowest Rank Sum is 4, for Set-Up "ac."
3.	Since the Rank Sum 4 is greater than the Critical Rank Value of 3, shown on the worksheet for the Sums of the first three Cycles, we must continue the Evop Phase with a further Cycle.
4.	The results of the fourth Cycle, the Ranks, and the new Sums are shown on the worksheet. The new lowest Rank Sum is 9, which corresponds to the Critical Rank Value of 9 for 4 Cycles. This indicates that a significant improvement has been obtained from Set-Up "ac" and that this Phase of the Evop program is completed.
5.	A new Phase 2 is started, using new Processing Set-Ups centered about the last optimum of "ac" found from step 4. Phase 2 went through five Cycles, as shown in *Figure 2b*.
6.	A further Phase 3 went through only three Cycles, as shown in *Figure 2c*, yielding an optimum of 30-32 Ends-Down (Column "1").
7.	The line of investigation for the currently used variables is discontinued as soon as the trend of results indicates that no further improvements can be made in the levels of the variables.
8.	A new Evop program is planned, using new combinations of variables. In a practical mill program, management will never run out of ideas for investigations or for variables to be pinpointed for optimum levels.

program where we didn't learn something, and knowledge can usually be used to effect savings. So far we credit Evop with saving us several hundred thousand dollars per year.

Technical Results. As I have mentioned, we have never had an Evop program that didn't teach us something. This flow of technical or process knowledge is a second basis for evaluating Evop. We have had case after case where Evop gave us information leading to better understanding of the technical aspects of the operation. Very often this information points the way to other investigations—not done by Evop—which bring very satisfactory results.

Although in such cases Evop can be credited only with an assist, this contribution of Evop has been very valuable and extremely welcome. Manpower is used more efficiently when such promising avenues are indicated, and Evop is almost like having a good dog out in front pointing to the birds.

The Human Factor. The third aspect of Evop is its effect on personnel. It is very easy to get discouraged when you work on a process that has high noise and some interactions to boot—the results are negative or meaningless and the engineer feels that all his time and effort were wasted. If this happens several times you have a morale problem, and this, while impossible to measure exactly, does cost money. Evop has been very effective here; I will point out one instance:

Two years ago we had one area where work and morale were at a minimum; it just seemed impossible to do anything that had not been done already. Today you have to stand in line to get a production unit on which to run your program—we do not have enough production equipment to run all the tests we have in mind. The men in that area are working 10 times as hard now as they were then and they are 100 times as happy. The morale couldn't be better—in the parlance of the younger generation they are real tigers.

Again, this effect is impossible to evaluate financially, but it is real nevertheless and despite our inability to assign it a dollar value, I am convinced that it is one of the most important rewards of Evop.

Editors' Note

The first article in this series, covering Linear Programming, appeared in TEXTILE INDUSTRIES for March. In succeeding articles, Mr. Enrick has described the use of Linear Programming to determine optimum product mix, the applications of Simplex Programming, and the basic principles of Evolutionary Operation.

Future articles in the series will deal with sales anticipation curves, market survey procedures, and determination of optimum lot sizes in the dyehouse or finishing plant to balance set-up and inventory costs.

Special rayon staple used in belting fabrics

■ THE TOUGHNESS and resistance to heat of Avisco XL-I rayon staple were primary factors which influenced management of Georgia Duck & Cordage Mill to choose it as the raw material for yarns to be used in their belting fabrics, American Viscose Corp. reports.

Since the fabric must be coated with natural or synthetic rubber when it is converted into belting, it must have the ability to adhere firmly to the covering material. Experience of Georgia Duck has been that yarns spun from Avisco XL-I fiber, which is made especially for industrial use, afford outstanding adhesion to the covering material.

According to the fiber producer, this rayon staple is about 40 per cent stronger than most fiber used previously in belting; hence, fabrics made from it offer substantially greater tensile strength and several times the fatigue life of other materials. Ability of the fiber to withstand higher temperatures makes it particularly suitable for belting which is required to operate in ovens and other high ambient temperature applications or to convey hot materials. Light weight and excellent flex characteristics are other advantages cited for belting fabrics made from this fiber.

A typical application of the mill's belting fabrics is this crushed stone conveyor. Note that the two belts are trough-shaped at the bottom of the photo and flat at the top. Obviously, high strength, light weight, and flexibility are required of the fabrics.

Shipping room operative at Georgia Duck & Cordage Mill pulls burlap cover onto a roll of fabric for delivery to a conveyor belt manufacturer. Note the mill-made hoist to facilitate handling of the heavy rolls of fabric; also the rayon cord strapping used to hold the fabric and its protective cover in place.

SRRL reports!

Check this to see if your mill can use some of the results of ten years of machinery development at Southern Regional Research Laboratory

by R. A. Rusca
Southern Regional Research Laboratory[1]
New Orleans, Louisiana

Exclusive

THE SOUTHERN Regional Research Laboratory was established in 1938 as an agency of the U. S. Department of Agriculture for the purpose of conducting research to increase the utilization of agricultural commodities grown in the southern part of the United States. The laboratory building was completed in 1941, and staffed soon thereafter.

Most of the work is concerned with lint cotton, starting with the baled fiber and stopping with the finished fabric. Research is carried out on chemical and physical treatments of fibers, yarns, and fabrics, and on the development of new and improved textile processing methods and machinery.

An essential part of the program to increase the use of cotton is the development of new textile processing equipment to raise the quality and lower the cost of cotton textiles. A 15- to 20-man team of engineers, physicists, fiber technologists, and technicians is assigned to this type research. This paper briefly reviews the Laboratory's machinery and apparatus developments for the period of July 1, 1950 to June 30, 1960.

Cleaning Equipment

The foreign matter in cotton is a major handicap in the competition of cotton with man-made fibers. To meet the need for better textile mill cleaning machines to cope with the higher-trash-content cottons resulting from mechanized and rough hand harvesting, a large share of the Laboratory's

[1]One of the Laboratories of the Southern Utilization Research and Development Division, Agricultural Research Service, U.S. Department of Agriculture.

machinery investigations has been directed toward the development of opening room equipment. This research has resulted in the "SRRL" series of cleaners.

SRRL Cotton Opener. The SRRL Cotton Opener (1,2)[2] was developed to open and blend cottons and to facilitate improved cleaning by the mills' existing equipment. The design is based on the principle of loosely restraining a large mass of cotton, imparting momentum to the mass, and then plucking out small tufts of fibers from the mass at a rate that avoids fiber damage and neps. The machine uses wire-wound cylinders for opening the cotton and similar cylinders for doffing the opened cotton into a high velocity air stream. About the physical size of a standard hopper-feeder, the Opener processes cotton at a production rate of more than 2,000 pounds per hour.

The Opener became commercially available in 1951. It is a very good opener and blender, but requires a large volume of air for satisfactory performance. About 400 Openers are in use throughout the world, processing an estimated 3 million bales of cotton annually. Twelve machinery manufacturers are licensed under USDA Patents (3,4) to produce the Opener.

SRRL Opener - Cleaner. The Opener-Cleaner (5,6) is basically the Opener with two integral cleaning cylinders and an improved doffing system. It retains the opening and blending ability of the original Opener and removes about one-third of the trash in the cotton at a production rate of 1,600 pounds per hour—sufficient for four picker lines. A new type air-brush (7) gently doffs the cotton by mechanical and aerodynamic action and also provides a large part of the air needed for conveying the stock to the next process.

The Opener-Cleaner was released for manufacture on October, 1958, and four of the 12 machinery firms licensed (8,9) by USDA are in active production. At the time of this writing, 65 machines are processing more than 700 thousand bales of cotton annually.

Mill results are in line with laboratory findings—2% to 3% waste removal on Low Middling cotton, with the waste being 80% to 85% trash and the remainder mostly short fiber.

SRRL Aerodynamic Cleaner. The Aerodynamic Cleaner (10,11) was developed specifically for adding cleaning to SRRL Openers and for increasing the cleaning efficiency of SRRL Opener-Cleaners. The device uses a specially designed duct (12) and high velocity air currents to affect a pop-the-whip action whereby motes and trash are ejected into a waste box.

Installing the air cleaner units on the Opener requires replacement of the doffing system and other modifications. The modified Opener takes out 15% to 20% of the trash in the cotton at a production rate of 1,600 pounds per hour.

Addition of the air cleaner unit to the Opener-Cleaner is simple; no modification of the machine is necessary. The Opener-Cleaner, Aerodynamic Cleaner combination removes about 40% of the trash at 1,600 pounds per hour production.

This development was made public in November, 1959, and a number of the Cleaners are now being installed. Nine manufacturers are licensed under USDA Patents (13,14) to produce the equipment.

SRRL Carding Cleaner. Developed primarily as the basic machine for a short-cut cleaning line, the Carding Cleaner (15) is a converted finisher picker capable of 50% cleaning at full picker production. A wire-wound beater and a wire-wound feed roll replace the conventional beater, feed roll, and evener motion. A fiber reclaiming system in the waste box recovers the lint falling with the trash. The resulting waste is about 90% trash and 10% nonspinnable fiber.

Publicly announced in December, 1959, the first Carding Cleaner unit for the textile industry is under construction. Five machinery manufacturers are licensed under patents (16,17) covering this development.

Carding Equipment

The cotton card, invented in 1748, is probably the most essential cotton textile processing machine. The only major change since that time was the introduction of revolving flats. Several years ago studies of the aerodynamics of carding (18) by the Laboratory led to the development of a radical modification of the conventional revolving flat card, described hereafter.

SRRL Granular Card. The Granular Card (19,20) is a standard card with the flat assembly replaced by a rigid, fixed cover coated with a carding surface of sharp-pointed aluminum oxide granules. A small metallic wire roll and a waste control licker-in cover complete the conversion. The apparatus eliminates flat strips, and materially reduces card maintenance and weight.

Seventy mills have about 200 granular top units under observation, both on fillet and metallic wire clothed cards. Reports (21,22) vary, ranging from excellent to inferior. In general, it appears that granular carding is best adapted for use in producing coarse and medium yarns where a slight increase in trash is not objectionable. Considerable time will be required to evaluate this radically new method of carding.

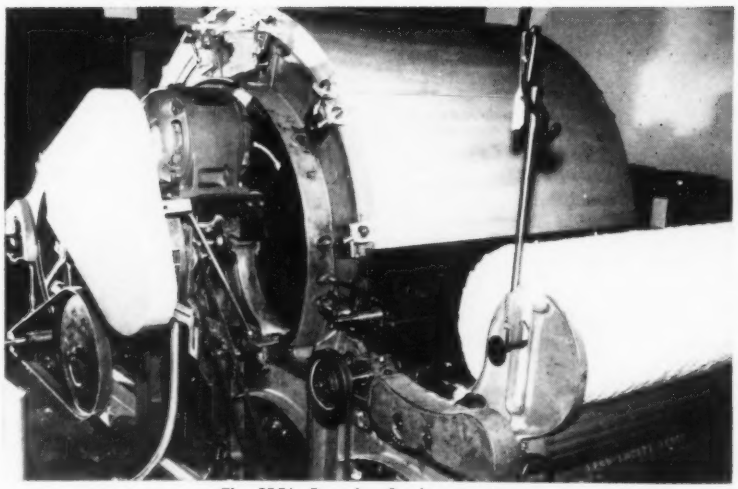
The basic patent (23) on the Granular Card is licensed by twenty-two machinery manufacturers.

Retracto-Pin Card Stripper. In connection with research at the Southern Regional Laboratory on chemical treatments of raw cotton, it was found in processing the cotton that the fillet wire card loaded so heavily that an improved method of continuously stripping the main cylinder was required. The Retracto-Pin Stripper (24) was developed for this purpose in 1954.

The device has a small rotor that traverses and strips the card cylinder through a slot in the back plate. Retractable pins in the rotor remove the impacted cotton and return the strips to the surface of the cylinder.

The development appeared

[2]Numbers in parentheses designate references at the end of the paper.

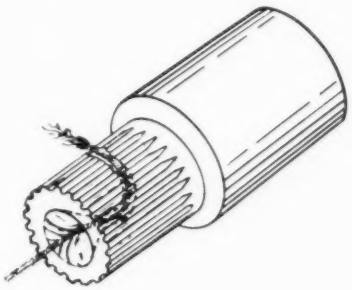


The SRRL Granular Card conversion.

promising; however, cooperative mill evaluations revealed mechanical problems which made it inadvisable to license the stripper patent (25).

Spinning Device. Many yarn spinning methods which overcome ring and traveler limitations have been developed (26), but none has proved practical. An experimental apparatus without rings and travelers was patented (27) in 1956 that operates on the principle of inserting twist by means of rotating fibers from the roving instead of rotating the yarn package. The device was capable of producing short lengths of fairly uniform yarns.

Research has been resumed recently to improve the method and to determine if it has practical value.



Slashing and Weaving Equipment

Improvements in slashing and weaving equipment aid in the production of higher quality fabrics. Developments by the Southern Regional Laboratory include an experimental slasher and two devices to facilitate weaving.

Slasher. Effective slashing of warp yarns is important to the textile industry, since the quality of the warps greatly influences weaving efficiency. An experimental slasher designed to improve the application of the size solution and drying the sized warps was developed about 10 years ago (28). The slasher incorporated a novel size system (29,30), an efficient gas-fired infrared drying oven (31), and a sensitive drive system capable of controlling warp tension during processing.

Two companies hold USDA licenses to produce the infrared oven, however, the slasher is not used commercially.

Loom Attachment. The SRRL Loom Attachment (32,33) is a device for use on standard cotton looms to facilitate the production of high-pickage and hard-to-weave fabrics. Two designs are available, one driven from the auxiliary camshaft and the other driven from above the warp.

Essentially, the attachment is a tensioning bar that splits the warp into two layers and operates in a manner to enable increasing the picks per inch considerably above normal.

High-pickage cotton fabrics should be useful in rainwear, tents, and similar items where wind- and water-resistance are required. A number of mills have experimented with the device; some report that it lowers weaving efficiency.

Two machinery manufacturers are licensed under the loom attachment patent (34).

Warp Tension Control Device. Developed primarily to obtain close control of fabric width for research studies, the warp tension control (35) may have application for the commercial production of high-count, hard-to-weave fabrics.

The device is a micrometrically adjustable control that replaces the conventional notched tension control collar on the loom. It provides a means for adjusting warp tension in small increments and also serves as a gauge to enable precision resetting at any time.

Miscellaneous Apparatus

The Saco-Lowell Sliver Tester[3] is a mechanical type instrument for measuring the uniformity of sliver and roving. The results are recorded on a strip chart. A means for converting the tester to electrical recording (36), recently improved (37), enables a much more rapid and accurate determination of uniformity than possible from a graphic record.

Manual operation of yarn board winders used for grading yarn by the ASTM method can affect results due to variable winding tension and turns per inch. A simple electric motor and change gear mechanism (38) minimizes these faults and thus reduces errors in grading.

For those long draft roving and

[3]It is not the policy of the Department to recommend the products of one company over those of any others engaged in the same business.

spinning frames that use split drafting aprons, a jig for installing new aprons was developed (39). The easy-to-use jig holds the apron ends in alignment and applies constant pressure to the glued ends while splicing the apron directly on the frame. Straight running aprons last longer and improve yarn uniformity.

A precision picker-knock-off motion that produces successive laps of identical yardage (40) can be installed easily on standard finisher pickers. Each lap is within three-eighth inch of the specified yardage, regardless of lap weight or cotton type. Research laboratories and pilot plants have found the device helpful for producing laps of almost any desired length.

Another device that increases lap uniformity is a pneumatic clutch to replace the conventional belt shifting picker device (41). Simple to construct and maintain, the unit eliminates the belt shifting lag that contributes to overshooting and undershooting yard-by-yard lap weights.

Basic Research

Most textile equipment is developed through applied research, that is, through the application of known principles and techniques. However, it is also essential that new, basic information be obtained that can be utilized in future developments. The Southern Regional Research Laboratory endeavors to maintain a balanced progam of applied and basic research. Several basic studies recently completed are described hereafter.

Electrostatics. Under contract from SRRL, Clemson Agricultural and Mechanical College, Clemson, S. C., conducted an investigation of the electrical properties of cotton fiber and of trash. The purpose of the study was to obtain fundamental information that would indicate the possibility of separating cotton and foreign matter by the use of electrostatic forces. The findings (42,43) are of value as a guide for further study in this field.

Ultrasonics. In search for new methods of cleaning cotton, a basic study was made by SRRL physicists of the effect of ultrasonic treatment in air on the structure of cotton (44). Low power sound waves produced no physical damage in cotton or trash; however, there was evidence of crystallinity change to a small degree. The results indicate that air-borne sonic energy, at the power and frequency studied, is not a promising medium for separating trash from cotton.

Aerodynamics. A fundamental study of the aerodynamics of the cotton card (18) has provided a clearer insight into the function of air in the carding process. Static and dynamic measurements with a sensitive electronic manometer indicated that air is not a major factor contributing to carding. This research led to the development of the Granular Card, mentioned earlier.

Cotton Degradation. A study was undertaken to determine if mechanical processing of cotton fibers into yarns causes any chemical degradation (45). Viscosity measurements made of cotton subjected to mechanical treatments varying in severity indicated relatively little change due to processing.

Commercialization

Research results are of no value unless made available to the industry. During the 10-year period covered by this report, the machinery development investigations team of the Laboratory obtained 21 U. S. Patents, published 44 technical articles, presented 33 papers before technical meetings and 7 before radio and television audiences.

Seventy patent licenses have been issued to thirty-four firms to manufacture machinery developments of the Southern Laboratory, and SRRL-type equipment valued at more than $2 million has been installed by the textile industry.

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Continued on page 82

Left to right: T. B. HAMRICK, Fieldcrest Mills, led the slashing discussion. L. AUBREY GOODSON, JR., gave his approach to keeping textiles in America. HERMAN CONE, JR., chairman of the N.N.C.-Va. Division, STA, conducted the meeting.

Having slasher problems?

Check this discussion report—maybe southern mill men came up with the answers

Staff report

THE SOUTHERN Textile Association's Northern North Carolina-Virginia Division held its spring meeting in Dan River Mills' Hylton Hall Auditorium recently, and heard *L. Aubrey Goodson Jr.*, vice-president and director of research, Dan River Mills, explain "One Approach to Keeping Textiles in America."

Creation of new products and improvement of existing products, along with creation of new manufacturing techniques to make older products less expensive, should help textiles in this country, the audience was told. There is a need for new and revolutionary machinery. The need for improvement calls for real imagination, creative ingenuity, free thinking, and unrestricted approaches. It is a time for boldness and a willingness to change, he emphasized.

The research state of mind should not be limited to the laboratory. It must be found at every level and in every part of the company, especially in the manufacturing plants, according to Mr. Goodson.

"If we are to preserve the American textile markets for the American textile industry, let top management do its part on the political front, and on the financial front by diverting appropriate funds to research and development. Let the laboratory and development people do their part by creating new ideas and bringing them to the plant. Let the manufacturing people take an aggressive part in the exploitation of new ideas, machines, and products so that the full potential of technical progress may be realized," Mr. Goodson concluded.

CMC Size. A discussion panel on slashing was led by *T. B. Hamrick* of Fieldcrest Mills, and the use of CMC size was discussed (see TEXTILE INDUSTRIES for October, 1960, p. 161). Seven per cent pickup was reported in one instance, with a reduction in relative humidity from 86 per cent to the current level of 78 per cent at 80 F and with increased efficiency in the weave room.

Not much difference was noted in shedding but the type of shedding was different from other types of size.

Rolled Ends. One mill reported trouble with rolled warps and ends on light fabrics (4700-4800 ends) while running 30 pounds air pressure on rolls. A 32-dent comb was used. Suggested cures for this trouble: Go over and under rods in threading up the slasher, change to 40-dent comb, run with less tension in the creel, run nine ends per dent, check pressure roll carefully.

Use of a splash roll helps keep size in the box while running the slasher at 125 ypm, one spokesman indicated.

Squeeze-Roll Pressure. The trial-and-error method is frequently used to determine the right pressure on squeeze rolls. A towel mill reported using 60 pounds pressure instead of the 30-40 pounds formerly used, and the change permitted 300-400 more yards on each beam of 10/2s to 20s.

Ends Sticking. Some trouble was experienced with ends sticking when 14s yarn was run on striped warps. With three to six or seven colors on the loom beam, sometimes three to four ends stick. On beam dyed yarns, the trouble occurred despite a lease on every beam of 2,500-2,800 ends. It was suggested to reduce the number of ends from 500 to 400 per section beam to give more air space and reduce the problem.

Another mill man suggested trying a warper lease (lease every end) instead of slasher lease. No one reported using a front lease in answer to a question about this practice.

In one instance where a change was made from 46-inch looms to 60-inch looms, warps appeared slack on the sides and packed in the middle. The comb not being pulled out evenly could cause this,

and the ends should be laid in for more uniformity, the discussion indicated.

A two-inch diameter bust rod was the most common size used to split yarn coming from the slasher cylinder, according to those answering this question. However, it was agreed that heavier sets require larger bust rods.

Several mills use less heat on the first can the yarn contacts on nine- and 11-cylinder slashers. Teflon-coated immersion rolls reportedly prevented laps and ran much better than uncoated rolls.

Wet Split. A wet-split roll contacting yarn coming out of the size box was removed in one instance because it picked up too many ends and broke them out when running nine beams to each size box for a total of 61,000 yards to a set of 32s yarn on a 36-inch beam.

A stop motion in use on slashers gave good results on sheeting warps after making the device sturdier by reinforcing, comments indicated.

It was generally agreed that taping warps for the tie-in saves waste at the loom. Also, it is desirable to wrap warps in paper to reduce waste upon storing warps for some time. Wrapping is best done upon doffing at the slasher, and 54-inch brown paper is usually used for this purpose.

Low-B.O.D. Starch. Good results were obtained with low-B.O.D. starch on a trial basis in one mill where eight per cent pickup was noted, with the same efficiency and not much difference in cost as compared to size formerly used in the mill reporting.

In discussing hot air slashers, good results were noted with frequent cleaning because efficiency suffers when foreign matter and lint accumulate through the air intake and on the radiators, a mill spokesman stated.

Pressure of 750 pounds plus roll weight gave good results on Griffin size box squeeze rolls in one mill. Rubber squeeze rolls compounded with fibers in the material give no trouble with blisters or peeling, according to mill experiences related.

Metal-to-metal contact at warp beam on slashers sometimes cuts yarn upon stopping. This trouble was stopped by wrapping the contact area of the press roll with masking tape to cushion the contact, it was said.

Woven goods *(from page 66)*

Although total production was on the low side, and most major divisions were down from the previous year, 1960 showed some advances and in fact new production highs in a few areas.

In cotton goods, total production of 9,328,279,000 linear yards was down 276,399,000 for the year, but held at better than the 1958 level. The most noteworthy performance, reflecting a continuance of a long-term upward trend in combed yarn goods, was shown by fine cotton fabrics which set a new all-time high in 1960 of 1,661,039,000 linear yards, a gain of 52,359,000 from the previous year. The major print cloth division, however, at 3,306,789,000, lost 76,060,000 yards and registered a new low since 1949. Colored goods fell to a new all-time low point of 455,270,000 yards, off 64,461,000 for the year, although it should be noted that the Government classification here covers mainly carded colored goods, considerable combed dyed yarn fabrics being reported in the fine goods grouping. Other major cotton goods divisions were all down for the year, although not to as low a point as in 1958.

In man-made fiber fabrics excepting rayon and acetate goods, production continued its almost constant annual increase which has carried these goods from their pilot stage around World War II to a new high for 1960 of 939,252,000 yards or well on the road to the billion yard level. Their gain from 1959 was 102,975,000 yards or 12.3 per cent.

But rayon and acetate fabrics at 1,428,044,000 were at a new low for the 20-year period. Filament yarn fabrics were at a new record low, spuns the lowest since 1946, combination fabrics lowest since 1941. Pile, upholstery, drapery, tapestry and tie fabrics, and the all-other classification of rayon-acetate goods, while off for the year, held at better than the 1958 level.

Woolen and worsted woven goods showed 283,295,000 yards for the year, off 27,536,000 from 1959.

Automobile tire cord and tire fabric not included in the broad woven goods data dropped to 418,439,000 pounds for the year, off 51,195,000 pounds, with both the cotton and man-made fiber components registering losses.

SRRL reports *(from page 80)*

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Spindles, brakes, tapes

discussed by Georgia operating executives

Staff report*

Spindle Brakes. The plants agree that bobbin brakes are necessary to prevent spinners from burning their hands as they stop the heavier and faster-moving packages. But the point at which the brakes become necessary is not defined, probably because of the great number of variables entering.

Either spindle speed, package weight (product of both length and diameter), or package density, or any combination of these, influences the decision: some plants say adopt the brakes with ring sizes of 2.5″ or greater; another states that any 12″ bobbin should require them; one uses them with spindle speeds of 3966 to 5621 rpm (2.75″ and 3″ rings); while still another uses them because of the soft twist being inserted.

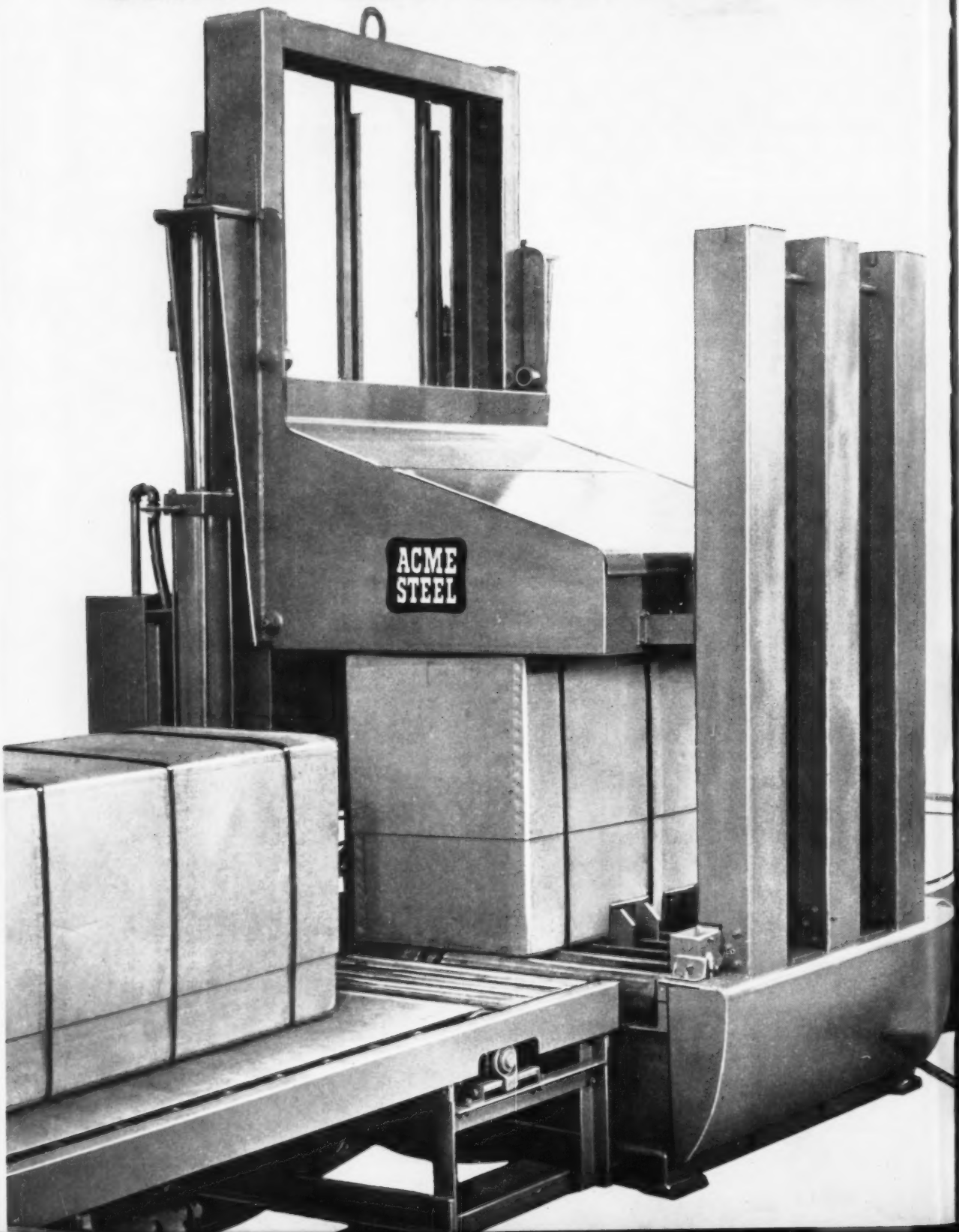
Spinning Tapes. Firms using

*Continuation of report of spring meeting of Textile Operating Executives of Georgia. First installment appeared in June issue, pages 73-77.

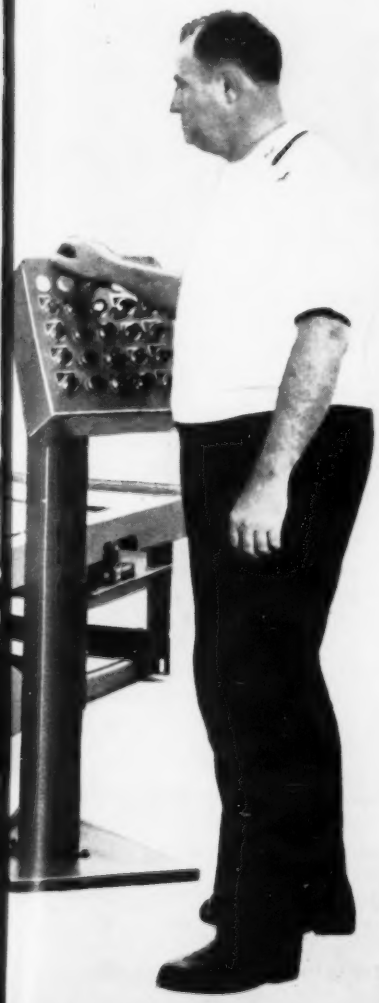
TOP DRIVE SPINDLE PERFORMANCE

Mill	Spindle speed (rpm)	Choke removal: how often?	Choke removal: by whom?	Blade wear	Extent wear inside wooden bobbins	Lubrication and remarks
B	see remarks	(8.25s) 8 hr (13.25s) 24 hr (9.50s) 8 hr (18.50s) 24 hr (21.00s) 24 hr (22.00s) 24 hr	doffer doffer doffer doffer doffer doffer	none	indeterminate	Flushed and oiled yearly; SKF bearings; speed is 10% above that for regular quills.
D	10,000	see remarks	——	some	extensive	Roller bearings flushed and oiled with Velocite E yearly; chokes on counts through 21.00s removed twice weekly, weekly on finer yarns.
E	10,000	at doff	doffer	none	——	Add Gulfspin 38 each 4 months, flush yearly; SKF bearings; uses paper tubes.
H	10,500	24 hr	doffer	none	——	Add Lilly White oil to SKF-317 bearings every 5 months, flush every 3 years; uses paper tubes.
I	10,000	120 hr	doffer	not known	slight	Add Gulf Endurance No. 37 each six months.
K	see remarks	see remarks	doffer	none	none	Chokes removed from 42.00s & 45.00s each 114 hours, from 27.00s each 72 hours; speed 5 to 10% higher than with usual type spindles; needle bearings flushed and oiled every 9 months with oil of 100 viscosity at 100 F.
L	9500	2 wk	traveler changer	very little	very little	Flushed and greased with Andok "C" every 3.5 years; New Era spindles; bobbins in good condition after eight years of service.
O	5651	as they appear	doffers	none	none	Ball-bearing bolsters oiled every six months, flushed every 12 months.
Q	——	——	clean-up man	none	very little	Oiled yearly with Velocite E, flushed every two years; spindle base cleaned at overhaul; doffer guards cleaned daily.
R	8500	at doff	doffer	none	——	Gulfspin 35 added, flushed yearly, no wooden bobbins used.
S	10,900 11,700	144 hr (warp) 48 hr (fill)	doffer doffer	none	very little	Roller bearings; spindle oil of 75-80 viscosity; flushed every two years.

CONVEY 'EM...COMPRESS 'EM...S



STRAP 'EM BY PUSHBUTTON



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Put pushbutton console where it's handiest. Example: operator weighs completed box while F11 automatically straps the next. Small box in machine demonstrates versatility of the F11.

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APRON PERFORMANCE ON DUO-ROTH DRAFTING

Mill	Best thickness to use	Material	Average life	Do they crack?	Cleaning method used	Remarks
C	0.032	synthetic	3 yr	no	wiping	Avoids using blowpipes, because they carry oil to aprons.
D	0.040	synthetic	18 mos	yes	—	Cracks begin appearing at 14 months.
E	0.030	synthetic	12 - 18 months	no	soap & water	——
F	0.055	synthetic	2 yr+	yes	roll pickers	Not Duo-Roth. Some originals still running. Overhead cleaners help.
G	0.040 0.050	synthetic	see remarks	—	—	Bottom aprons run 12 to 18 months. Top ones last 18 to 24 months. Thickest apron on top.
H	0.040	synthetic	—	yes	blow off	Still evaluating apron life.
I	0.040	synthetic	2 yr	see remarks	detergent & water	Strings fray from selvages.
Q	0.050	synthetic	—	no	revolving clearers	——
S	0.040	leather	2 yr	no	brush	Cleans aprons every two weeks.
T	0.040	synthetic	18 mos	yes	pick by hand	——
V	0.040	synthetic	2 yr	yes	see remarks	Aprons cleaned on regular picking cycle and at semiannual roll scrubbings. Cracks appear if aprons are run more than two years.

the conventional tapes are for the most part using 5/8" widths, with 3/4" widths being used now and then. In one plant, using Piedmont frames, 1/4" and 1/2" laminated endless tapes are in use. Nine plants use cotton tapes; ten use nylon with some using both and one using a nylon-cotton blend.

Most of the topic is built around a mill's using nylon tape, and for that reason the balance of this discussion will treat that type of tape alone.

Two mills have noted a slight increase in spindle speed, one has noticed a slightly more uniform spindle speed, and the other didn't report on that topic.

In most instances nylon tape life appears considerably greater than that of cotton, in some instances three or four times. *Mill C* is replacing nylon tapes at the rate of 25 per shift on their 108,400 spindles against the 45 per shift they averaged on cotton tapes. The firm has some nylon tapes that have been running three years and expect them to outlast their cotton tapes, but, the firm states, some of their cotton tapes have been running 10 years.

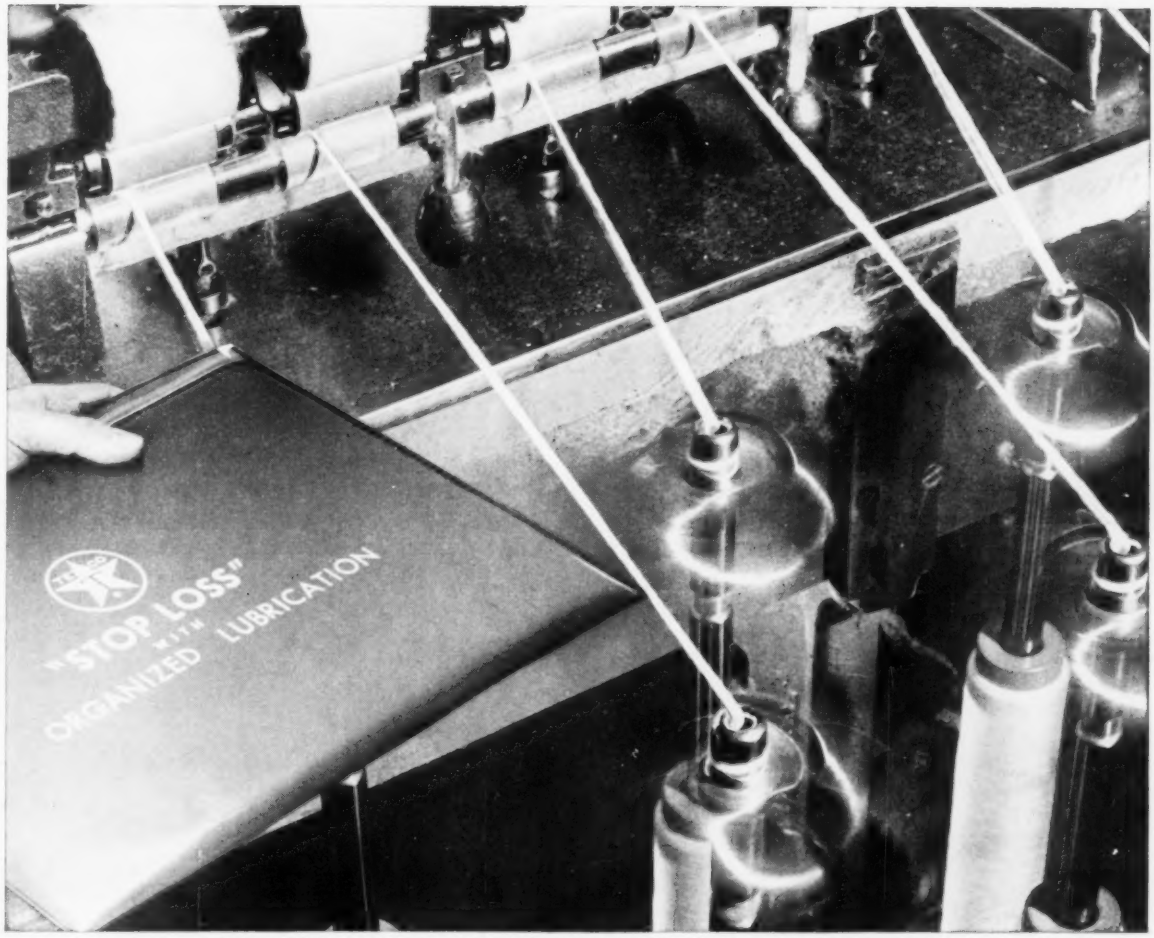
The five mills mentioning the use of brakes in conjunction with nylon tapes report no melting or burning off of tapes when the brakes are used. The balance of the mills did not respond to that part of the question.

Nylon tape loading is a big problem in some instances; in some it doesn't even exist. The range of remarks concerning this run from "badly" (the firm uses a tape of nylon-cotton blend) to "not as much" and include "slightly more," a simple "yes," and a just as simple "no." Methods used in cleaning or unloading these tapes run from holding a hacksaw blade against the tapes to holding a board covered with card clothing against them. Other methods: applying a small wire brush; blasting with air jets; and holding the pointed end of a file vertically against the tapes. The nylon tapes require less power in three instances, have produced "no change" in two cases, and three times draw a "none noticed."

Creeling. Block creeling the large roving packages (12" x 6" and larger) seems adequately answered with *Mill C's* "We have not found an acceptable method of block creeling." *Mill A* had already stated, "We experimented for one month, block creeling one 216-spindle warp frame . . . due to variation in slubber and spinning production, creel running time varied . . . this 32-minute variation would play havoc with any schedule creeling on a large scale . . ."

Creeling the narrow gauge frames equipped with umbrella creels will keep the roving packages from rubbing each other, the consensus reports. One firm has licked the problem by using "conventional creels with variations."

● *Highlights of the carding discussion will appear in the August issue.—The Editors.*



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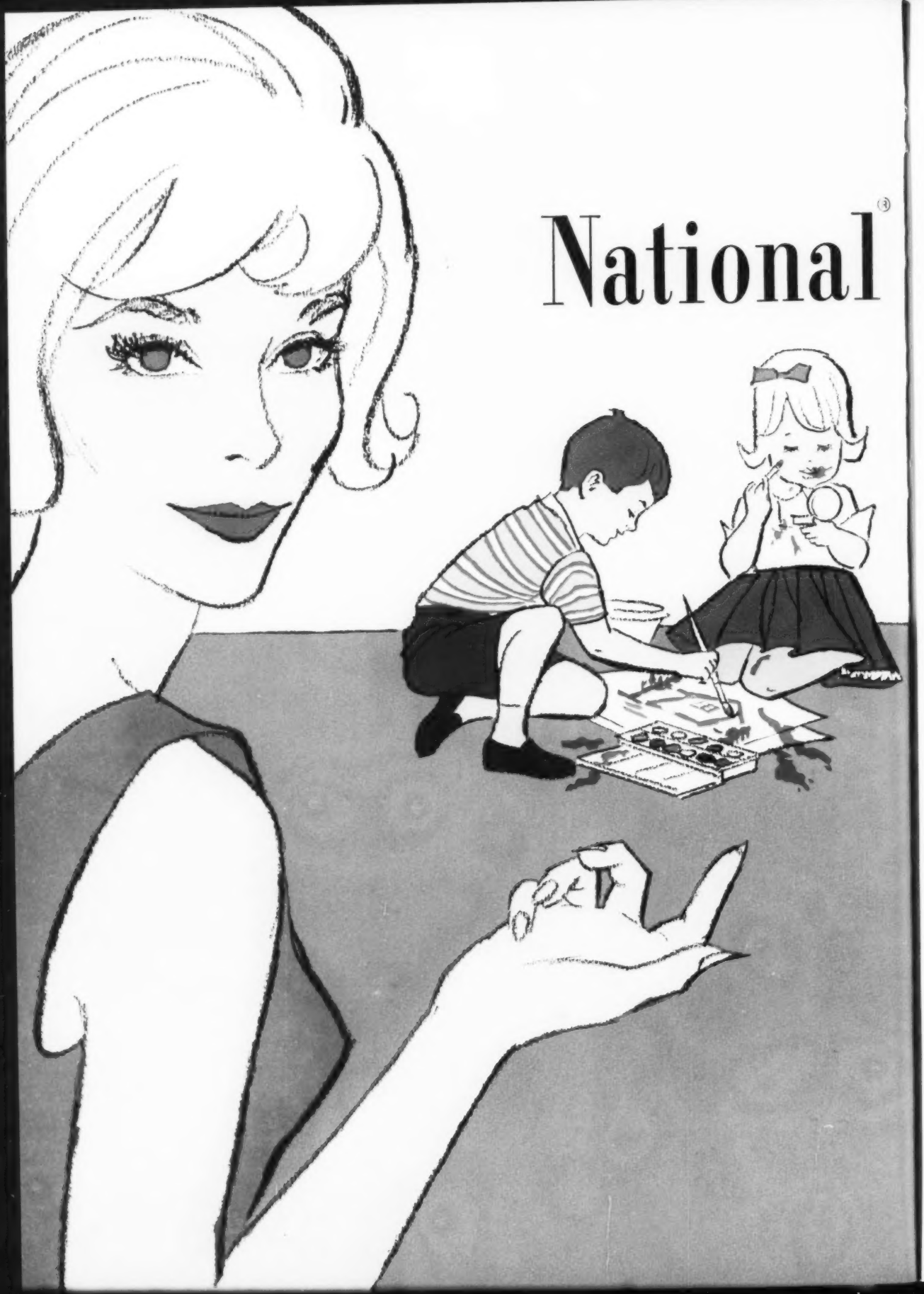
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Colors in the illustration, left, are self-shades and combinations of the dyes shown below. They were chosen from the complete range of National Sulfur Dye Solutions because of current interest in these shades.

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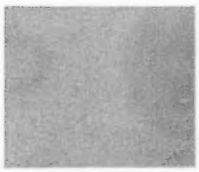

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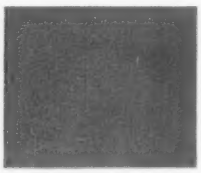

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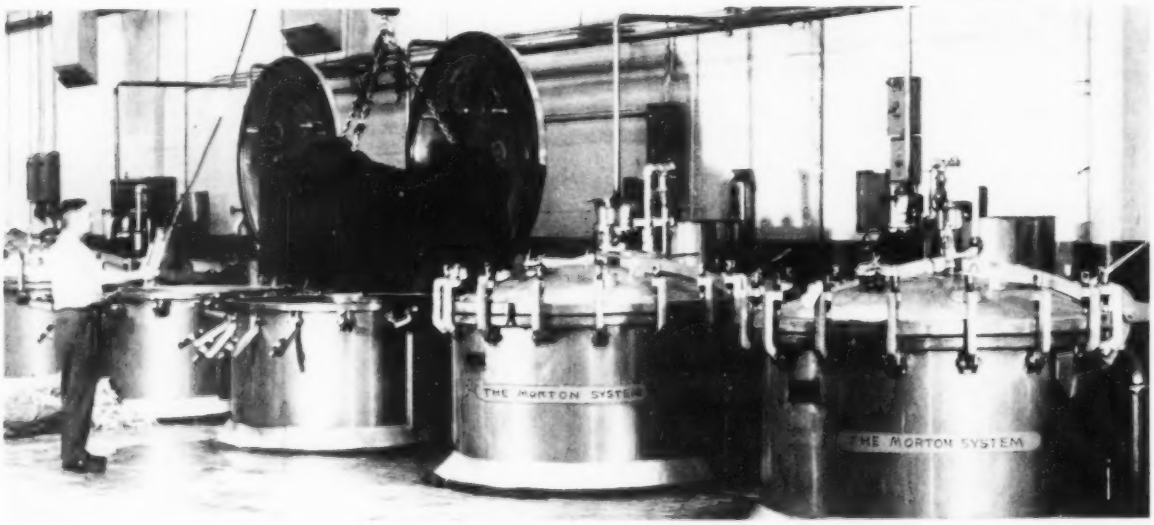

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For further information use Handy Return Card, Page 149

Carpet dyed to match "any color in the world" is now about 11% of output at Wunda Weve

Staff prepared Exclusive

Wunda Weve will match carpet to "any color in the world." Here lab technicians match the colors of a rose and a cantaloupe; they'll also match feathers, dog hair, what have you.

Custom dyeing boosts sales

IF YOU'RE a customer of Wunda Weve Carpet Co., Greenville, S. C., you can choose your carpet in any color in the world. Wunda Weve went all out in 1957 to make exactly what individual customers want, with special emphasis on color preference. "Any color in the world" is offered as a custom dye service; customers can have carpet dyed to suit their tastes at an additional cost of a dollar per square yard.

The service has gone over with a bang: Custom yardage is now about 11 per cent of total production; about 25 per cent of the firm's accounts offer it. The program is self-sustaining, paying its way while increasing yardage sales and providing an exclusive and attractive service for dealers.

The low dollar-per-yard extra cost for the custom color service along with quick delivery give added push to the sales aid. Dealers can offer matched samples for customer approval within four days after the order reaches the factory, and delivery of the carpet can be made 7 to 14 days after confirmation of the order. The

special service does not interfere with other production in the plant.

How They Do It. Here's how the custom dye service works: The dealer sends a color item to the plant to be matched (wall paper, pillow, a feather, dog hair, etc.). The dye department works with dye suppliers to produce matching fast dye, and a 6″ x 9″ swatch is dyed. The sample is always of the construction being considered, and half of the beaker sample is sent air mail special to the customer for approval of the color match.

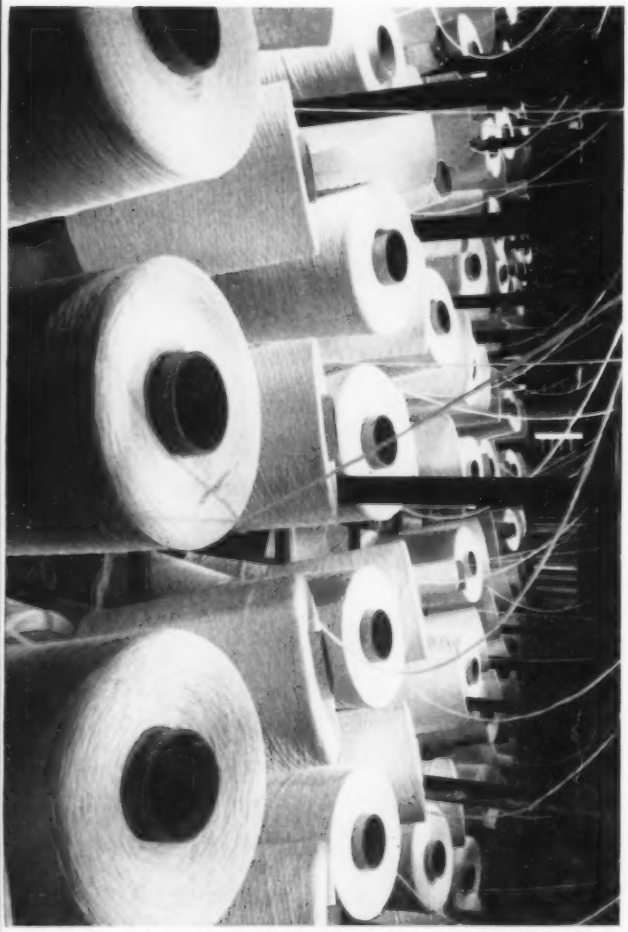
Upon receipt of confirmation of the color match, white carpeting is taken from regular mill production, is dyed, and is shipped within about 7 days. Any size carpet is dyed to order but the minimum practical size in view of the minimum dye charge is about 30 square yards. Some types of carpets require colored yarn construction which calls for dyed raw stock. Of course, such carpets are not part of the regular custom color service. On the other hand, all continuous filament goods produced in this plant are piece dyed to obtain uniformity of color. The custom work appeals to budget-minded customers and is done primarily on nylon and cotton constructions.

An important advantage of the custom dye service lies in keeping the company directly and constantly in touch with the changing color preferences of the consumer. And it gives an assist to the company in its exchange of information with franchised retail dealers, helping them to stock desired colors while they are in active demand.

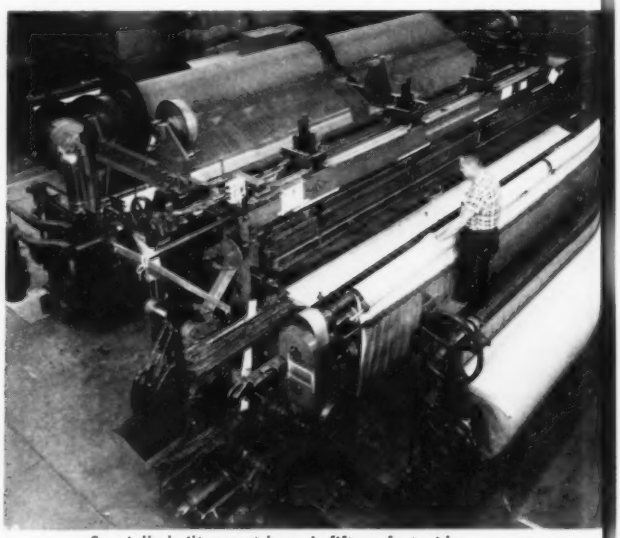
The Wunda Weve Line. The plant in Greenville performs weaving, tufting, knitting, and finishing operations. Plush-type carpets are woven on specially built 12-ft and 15-ft looms. Broadloom carpets are produced on looms designed, built, and installed by employees. Some twist carpets and velvets are also woven.

Cotton, nylon, and wool are used, with all yarns purchased from outside sources. Backing yarns for warps are purchased on beams; pile yarns are purchased on cones and rewound on the warp beam.

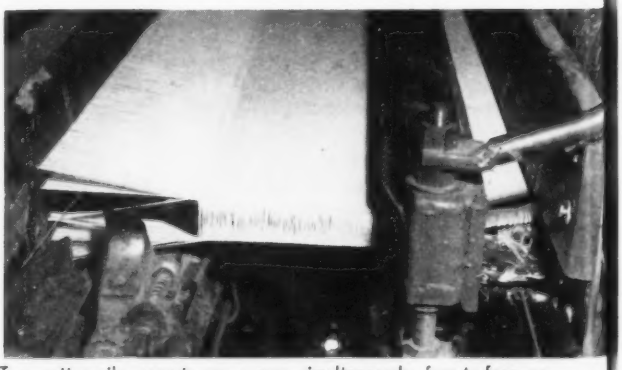
All backing yarns used on



All tufted carpets in Wunda Weve's line are made of Du Pont's filament Nylon 501, or Chemstrand's Cumuloft—bulked yarns.



Specially built carpet loom is fifteen feet wide.



Two cotton-pile carpets are woven simultaneously face-to-face on this specially built double plush loom.

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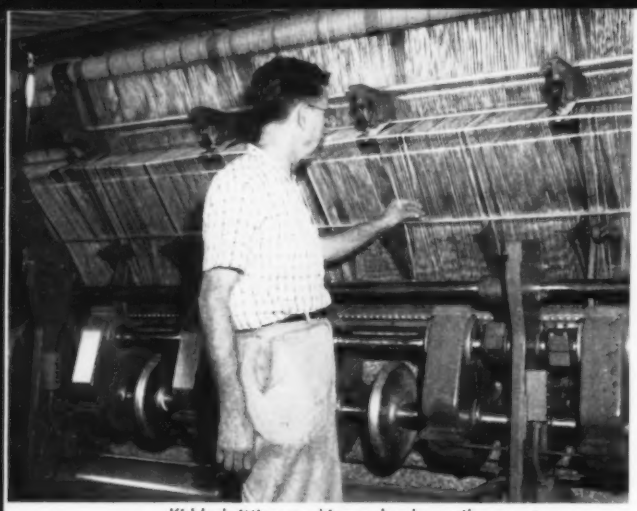
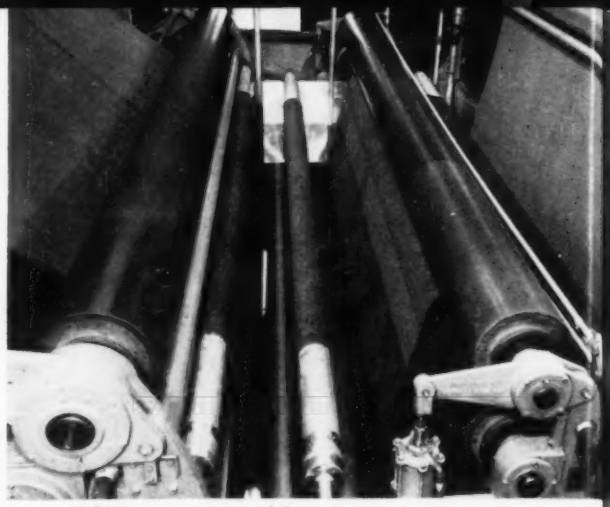


Kidde knitting machine makes loop-pile carpet.



Cold-water treatment stabilizes stock dyed carpets.

Backs of nylon, wool carpets are latexed, cotton on customer order.

This cotton carpet is receiving the last of three inspections.

woven goods are 100% cotton, because this construction has proved most satisfactory in good quality goods. Management at this plant considers woven carpet the most satisfactory in durability and appearance.

All tufted carpets in Wunda Weve's line are made of Du Pont's continuous filament Nylon 501, and Chemstrand's Cumuloft. The latest-type high-speed tufting machine was purchased last summer to handle widths up to 15 ft.

Weaving. Two men operate each loom. One changes shuttles and carefully watches operation of the loom. (A shuttle runs about three minutes before requiring change by hand.) The other checks pile height and observes the rearward portion for yarn breaks, as well as any other factor affecting quality.

Tufting. One person controls operation of the tufting machine. Two others inspect the carpet as it comes off to intercept trouble quickly. One operative watches the face of carpet, another watches the back. The well lighted inspection equipment operates in tandem with the tufting machine.

A Kidde warp knitting machine makes looped pile carpet, and knitted carpets round out the line offered by this company.

On tufted goods, jute fabric is tufted and a jute scrim is fastened onto the dyed and dried fabric. Latex is applied to the tufted

Continued on page 110

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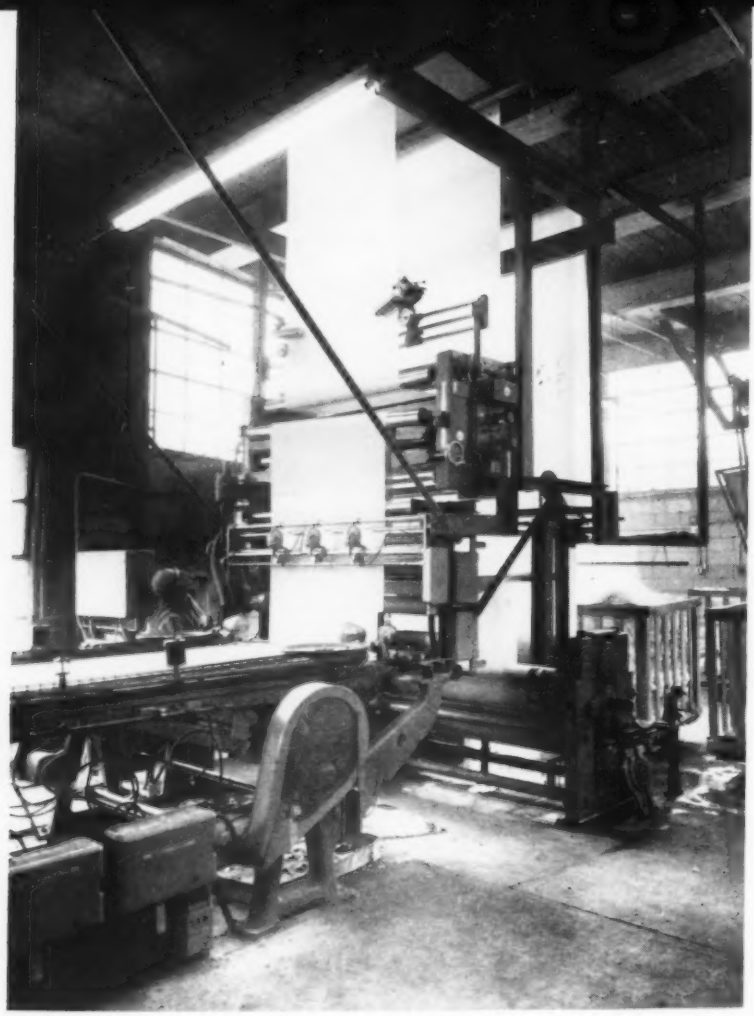


Entering end of Allied Textile Printers' new drying range, showing efficient arrangement of weft straighteners and detecting devices. Fabric passes through padder and compensator and then takes overhead route to enter weft straighteners. Then it passes through one of two detecting devices—optical or mechanical—located at entering end of tenter frame. Here fabric is being inspected by the optical Orthomat system.

Orthomat consists of a detecting system (left photo) and a control panel (right photo). Direction of the filling threads is detected at three locations on the running fabric and indicated on three individual direction indicators, located at top of control panel. In photo, the three pointers are in horizontal positions, indicating that filling threads are running at right angle to warp across the entire fabric. A skewed or bowed condition is immediately detected and indicated on the panel for automatic corrective action.

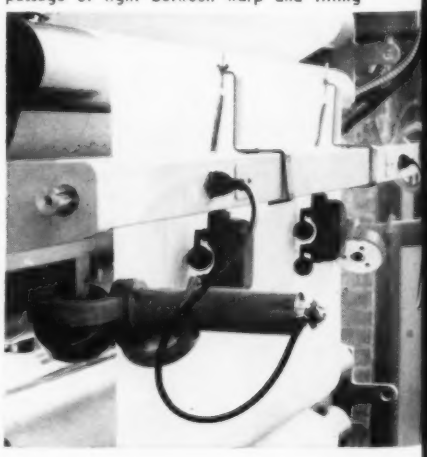
bow and skew correction automated

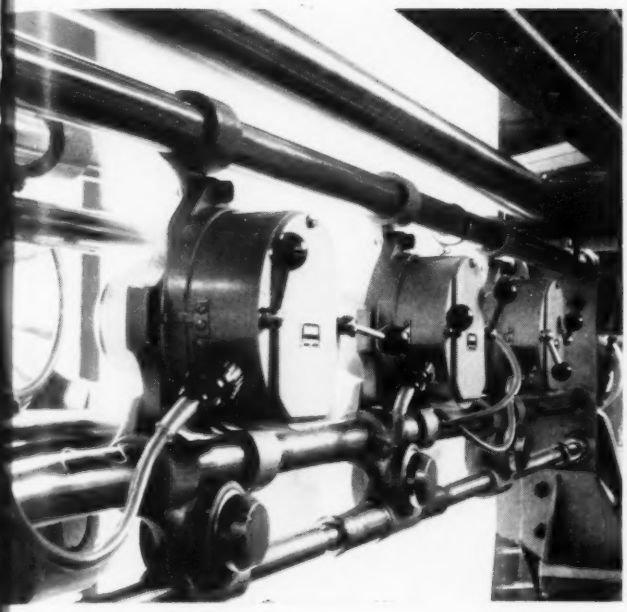
How a quality-minded printing and finishing plant solved an old problem with weft-straightening equipment that uses optical and mechanical detection

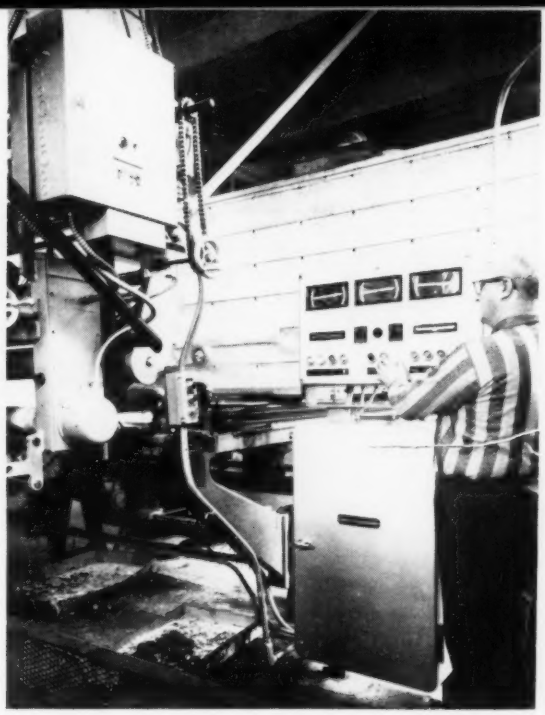
Staff prepared — Exclusive

IN QUALITY finishing plants the weft straightening operation ranks high in importance. The reasons for this management viewpoint are quite obvious: Even the most smartly styled fabric cannot drape properly, or give the desired performance in wear if its warp and filling threads are not aligned at right angles to each other. In the case of printed fabrics, such a defect represents a total loss, even if detected before

Mechanical system of detection (Bow-Skew Liner) is used by Allied on about 50% of fabrics processed—heavier weight and more closely woven fabrics which do not allow passage of light between warp and filling







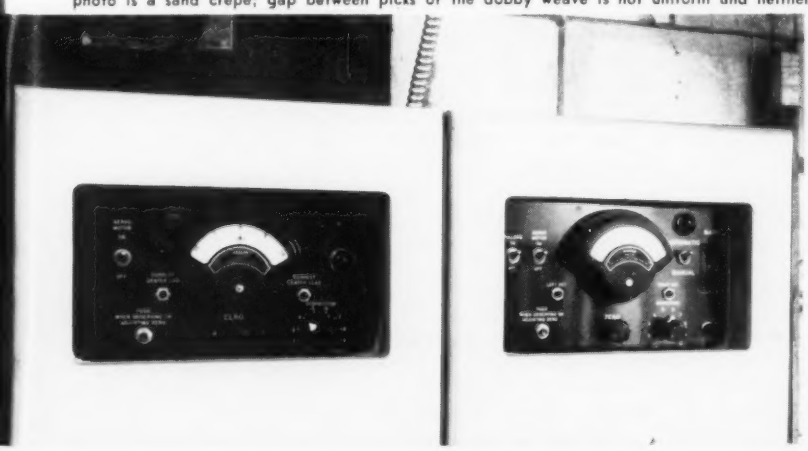
garment manufacture; for no amount of rehandling can restore the proper relationship between the printed pattern and the warp-filling threads if the colors were printed on a bowed or skewed fabric.

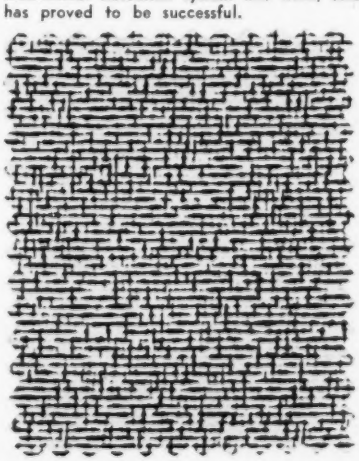
But fabric distortion is equally serious on dyed and plain finished fabrics—in today's finishing technologies the fabrics are usually permanently stabilized, either by chemical or heat-setting treatments. The only sensible solution, then, is to straighten the fabric at the correct point in finishing by the best means available. Yet in the past, the best available equipment was not satisfactory to meet all weft straightening problems, particularly in a plant where numerous fabric qualities were printed, dyed, and finished.

This is precisely the condition that faced the highly diversified Allied Textile Printers of Paterson, N. J., finishers of high quality synthetic fabrics and blends. On any given day, Allied might be processing many different fabric qualities in all categories of weight, varying in weave, texture, and fiber content. These include fabrics of rayon, acetate, and Bemberg, as well as fabrics of nylon, the polyesters, and acrylics, not to mention fabrics and blends of cotton and silk.

Continued on page 99

interlacings. Rollers at each selvage (left photo) periodically stretch fabric across its width, transmitting any filling distortion to the warp threads for detection by sensing rollers which ride the cloth. Rollers in turn indicate filling distortion to control centers (center photo) which automatically signal for proper corrective action. Fabric in right photo is a sand crepe; gap between picks of the dobby weave is not uniform and neither is the light penetration. So in this case the optical system of detection proved impractical to use. Therefore Mount Hope's mechanical detection system was tried, and has proved to be successful.





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GAFAC RE-610 and other GAFAC surfactants are effective at various other stages in the processing of cellulosic and synthetic-fiber yarns, piece goods, and hosiery. Write for data sheet TA-63 entitled "GAFAC Surfactants in Textile Processing."

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Bow and skew

(from page 97)

No Solution at First. Like most finishing plants, Allied tried to solve the problems of web control by visual inspection, and by various methods of manual manipulation of fabric. At one point, the company purchased an automatic control device, which used a system of reflected light as the sensing mechanism. While it was interesting in theory, it could not be made to work consistently well on all fabrics since the light reflecting values of individual fabrics seriously affected the sensing and correcting mechanism.

Allied was therefore content to tackle its weft straightening problems as best as it could through quality workmanship and supervision, recognizing, however, that its problem still awaited a more satisfactory solution.

In the meantime, interested equipment and electronics manufacturers, both in the U. S. and abroad, began to research the problem of weft straightening with greater haste, for it was evident that as speeds of finishing ranges continued to increase, the human eye could no longer detect bows and skews and other forms of fabric distortion. What was clearly needed was an assembly of equipment and instrumentation for accurate detection of bows and skews, in all weaves, with provision for instantaneous signaling to a control center, from which impulses would be sent to a motor for the proper weft straightening action.

Double-Barrelled Solution. Such a versatile "package" was made available to Allied for evaluation by the Mount Hope Machine Co., Inc. It consisted of two systems of detection: optical and electromechanical. In the optical system, marketed under the name of Mount Hope Orthomat, three detectors are arranged on a bar on one side of the running fabric. Opposite each detector (on the other side of the fabric) is a projector which sends a beam of light through the fabric.

The direction of the filling is thus detected at three locations on the running fabric and indicated on three individual direction indicators located on the control panel. If the filling threads are skewed or bowed, the proper control impulses are transmitted to the motor of the skew straightener, or to the motor of the bow straightener, for automatic correction.

This optical detection system worked well on many fabrics going through the Allied plant—until a sand crepe weave was run. The sand crepe is a dobby weave into which a star-like figure is interwoven. Thus, the gap between filling threads is not uniform and neither is the light penetration.

Since optical detection proved impracticable, Mount Hope's mechanical detection system, the Bow-Skew Liner, was tried. This system is based on the principle that if filling distortion is present it can be transmitted to the warp threads by intermittent stretching of the fabric at the selvages for detection by two "sensing" rollers which ride lightly on the cloth. These detectors then instantaneously signal for the required corrective action to the Mount Hope Compak unit.

To correct a skewed condition, a roll is pivoted at the selvage to retard the leading side of the biased fabric. To correct a bowed condition, expanders with bows are turned into the fabric while the pivot roll remains straight. (The optical Orthomat system likewise signals to the Compak for corrective weft straightening.)

This mechanical system solved the problem of detecting filling distortion in the sand crepe weave, as well as in many other weaves which do not allow light to pass in a uniform pattern between the interlacings of warp and filling.

Set-Up at Allied. Now assured that it had versatile and adequate weft-straightening equipment, Allied assembled a tenter-drying range, with both systems of detection and the required weft straightening equipment—all arranged into a smooth and efficient operation that can be seen in the accompanying photographs.

The drying installation, which precedes printing, is located next to Allied's bleaching and preparatory departments. The prepared fabric is first opened and plaited in a separate operation located behind the entering end of the drying range. It then passes through a mangle and a compensator, and after taking an overhead route through precision guiders enters the straightening unit, which receives instructions from either the Orthomat or the Bow-Skew Liner (whichever is operating).

Allied uses each system about 50% of the time. The Orthomat is generally suitable for delicate fabrics, while the Bow-Skew Liner is used for heavier and more complicated weaves, such as the sand crepe. Speed of the dryer averages between 90 and 100 ypm. Following drying, the cloth is batched after being pulled through the frame by a variable speed draw roll which applies tension across the width of the fabric to prevent a lagging bow.

Allied's installation has now been in operation since October of last year, a long enough period for an appraisal of its advantages. As summed up by Chief Engineer Granby, whose mechanical crew installed the range and worked with Mt. Hope engineers, these are the principal advantages:

The new drying range now turns out twice as much cloth as two comparable ranges did under the old system—a four-fold increase.

There is virtually no rehandling of cloth, since bows and skews (the most common forms of fabric distortion) are removed.

There is considerable upgrading of labor. Under the old system, an operator had to be on constant duty, confined to the tedious job of inspecting the cloth and straightening it by hand manipulations. Now he is free for more interesting and rewarding work.

Of these advantages, quality becomes the most important after the fabric leaves the plant. The new drying installation is certainly an important step toward maintaining the high standards of quality for which Allied has become known in high fashion apparel trades.

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Do-it-yourself drycleaning

It presents new opportunities—and new problems—for the textile industry

by Stanley M. Suchecki
Associate Editor

Exclusive

IT HAS been a long-range dream of the textile industry to develop fabrics which could meet new heights of performance and offer, besides, economy in their maintenance. For some years now the consumer has been offered an inexhaustible variety of fabrics, under the well-publicized category of "wash-and-wear," which aim at accomplishing these ends. The key properties that such fabrics must possess for a smooth appearance after laundering are crease retention and recovery from deformation.

Most strategies in merchandising apparel fabrics today take into account the appealing economics of home laundering, a practice which is convenient and time-saving, and releases the consumer from an age-old drudgery. There have been some departures from this widespread practice, however, as in the preference of consumers for drycleaning "wash-and-wear" suits—pointing up the difficulty in predicting consumer practices in the maintenance of textiles.

Until recently, dry cleaning has been restricted to higher cost garments, and to those materials—such as silks—known to pose problems in laundering. These the consumer has been educated to entrust only to the hands of a professional drycleaner. Now a new and more economical drycleaning facility is being offered the consumer at about 75% the cost of professional drycleaning. This is the coin-operated, automatic drycleaning machine, which is making an appearance in all parts of the country.

Two drycleaning systems are being made available. In the first system, already in use, perchlorethylene is used as the solvent at room temperature, requiring about 50 minutes for completion of the cleaning-drying cycle, which is automatically controlled. The machine accommodates about 8 lb of textiles, which are cleaned at a cost to the consumer of about $1.50.

The second drycleaning system will utilize a completely different drycleaning fluid, based on a fluorocarbon formulation, containing detergent and other essential ingredients. The product is a development of the Du Pont Co., and is being marketed under the name of Valclene. It has been demonstrated in trial runs that this product can reduce the cleaning-drying cycle by about one-third, to about 20 minutes. Its high volatility, however, requires a machine of special design with tightly sealed openings and fittings. Several manufacturers are now designing suitable models and expect to introduce them by late summer.

This cleaning formulation does not contain perchlorethylene; its solvent action is derived from a combination of fluorocarbons. The formulation also contains a detergent, a fabric conditioner, and an anti-static agent; and is said to minimize soil deposition and fabric shrinkage. Its action on fibers, fabrics, colors, and finishes has been observed and found to be satisfactory for use. It has also been successfully used on plastic materials, adhesives, and rubber compounds which are normally used in the make up of many garments.

Since it is higher in cost than perchlorethylene, and the machinery to utilize it will be considerably more expensive to manufacture, the ultimate cost of cleaning to the consumer will be proportionately higher. One large manufacturer of drycleaning equipment believes that this cleaning fluid will not replace perchlorethylene, but that it will find usage when the consumer wants faster service and is willing to pay for it.

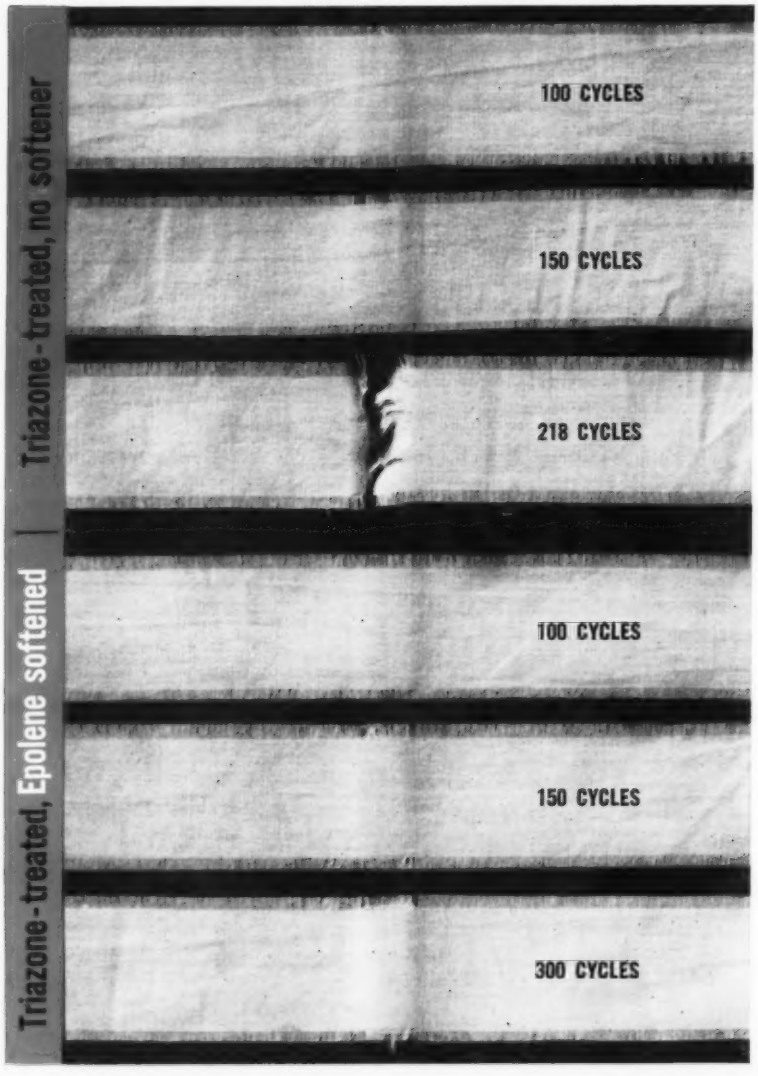
Whether these developments will cause a shift away from laundering is an interesting matter for speculation. For it has been noted, even before the introduction of the coin-operated machine, that a slight upward rise in drycleaning of cotton dresswear has taken place—at least for the first year of wear. There is some justification for such a trend, quite apart from any economic considerations. "Wash-and-wear" garments have been giving erratic performances, and in many cases present problems in laundering. Furthermore, the consumer is continually bewildered by laundering instructions which vary widely in their recommendations from one garment to another. Drycleaning, on the other hand, is a one-bath operation and easily controlled.

Less Laundering, More Drycleaning? There is some belief, therefore, that even popular-priced garments, which are traditionally laundered, will find their way to the coin-operated machine. This gives a new importance to the drycleaning fastness of resin-bonded pigments—at least where perchlorethylene is used.

Albert Johnson, of the National Institute of Drycleaning, points out that Tentative Test Method

Continued on page 107

The Stoll-Flex Abrasion Test demonstrates the increased strength given to a resin-treated cotton fabric by an Epolene softener.



IT is axiomatic in the textile industry that the finishing resin alone does not a wash-and-wear fabric make. In fact, the variables are many, and often complex.

Of primary importance is selection of the softener. If properly chosen to match the specific type of finishing resin to be used, the combination can provide the optimum in tear strength, abrasion resistance, crease recovery, hand, and sewability for the treated fabrics.

Eastman offers three emulsifiable types of polyethylene resins for use as softeners... Epolene E-10, Epolene E-11, and Epolene E-12. These low-molecular-weight polyethylenes are suitable for either nonionic, anionic, or cationic systems, easily forming emulsions that are stable and low in color.

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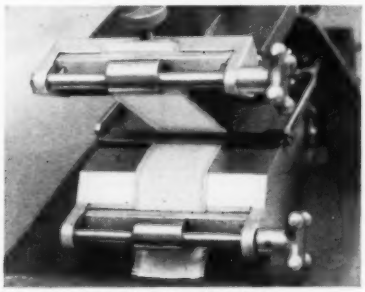

Stoll-Flex Abrader

wear resins in use today. These include triazone, triazene, melamine formaldehyde, methylated melamine formaldehyde, dimethylol ethylene urea, and methylated urea-formaldehyde type finishing resins. The results of these test procedures are available to aid you in selecting the right softener for your finishing requirements.

For further information about Epolene textile emulsions, their preparation and use, contact your Eastman representative, or write Eastman Chemical Products, Inc., subsidiary of Eastman Kodak Company, Kingsport, Tenn.

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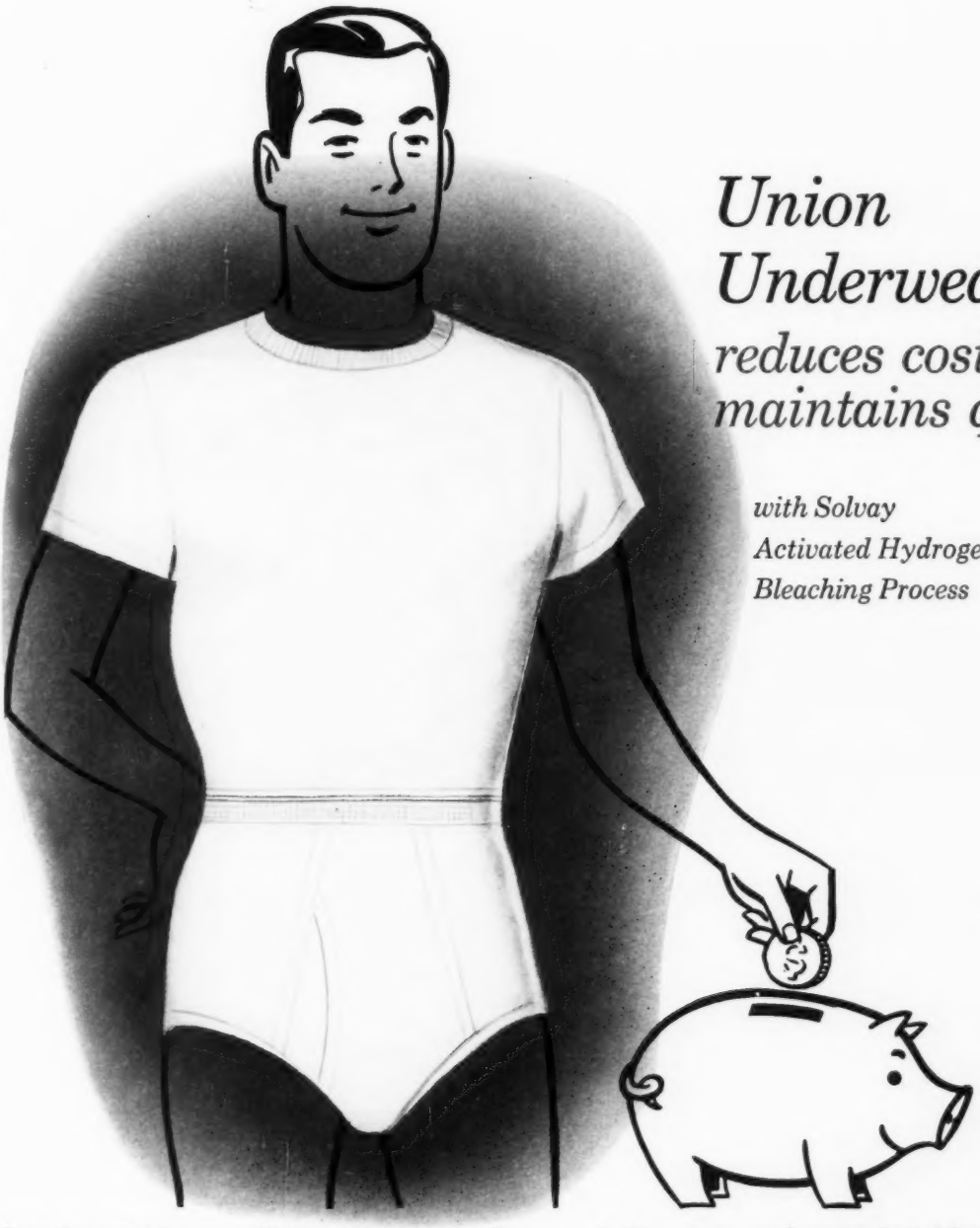

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reduces costs... maintains quality

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Over the past nine years Union Underwear Co., Inc.—licensed manufacturers of "Fruit-of-the-Loom" brand underwear—has maintained their quality standard without increasing prices. An important factor in this improved manufacturing efficiency was their adoption of the *Solvay Activated Hydrogen Peroxide Bleaching Process.*

The Solvay Activated Hydrogen Peroxide Bleaching Process is a new method for bleaching cotton developed by Allied Chemical Corporation and available under a royalty-free license. This new process can give you whites equal to your present process with an important decrease in costs . . . consumption of hydrogen peroxide and additives can be reduced 25 to 50% depending on purity of cotton before bleaching. Or, you can achieve whiter whites at no increase in cost.

Solvay can provide technical service to help you evaluate this new process for your plant. A booklet is available from Solvay which describes application, advantages, cost analysis and comparative quality . . . full details on the techniques and results you can expect. Write today for your free copy of "Solvay Activated Hydrogen Peroxide Bleaching Process for Cotton."

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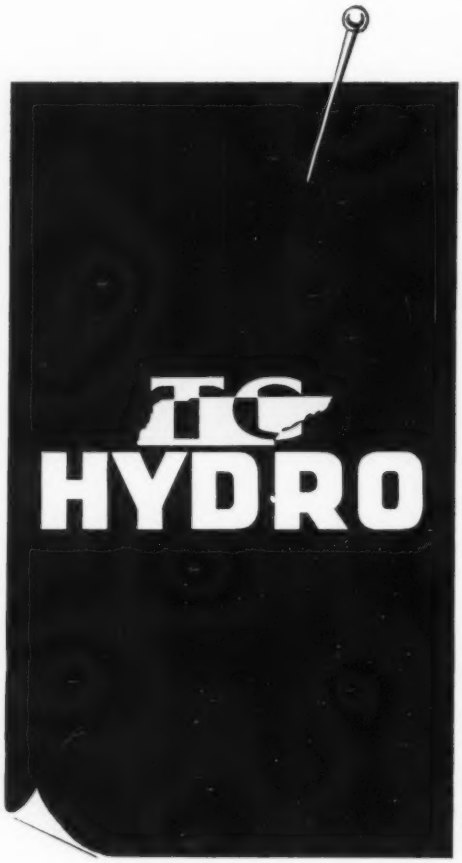

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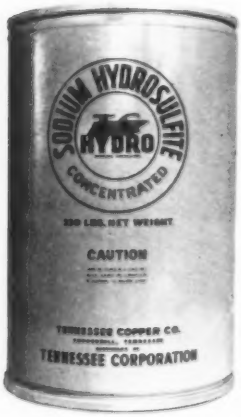

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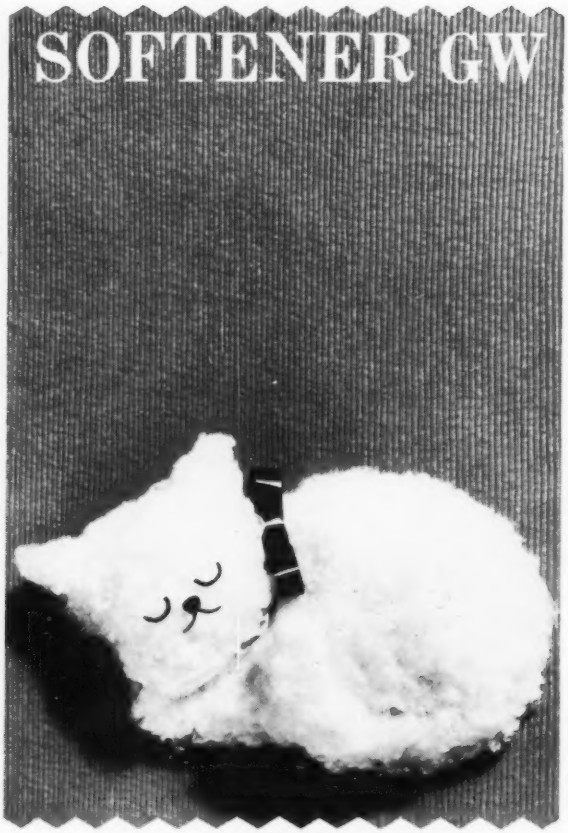

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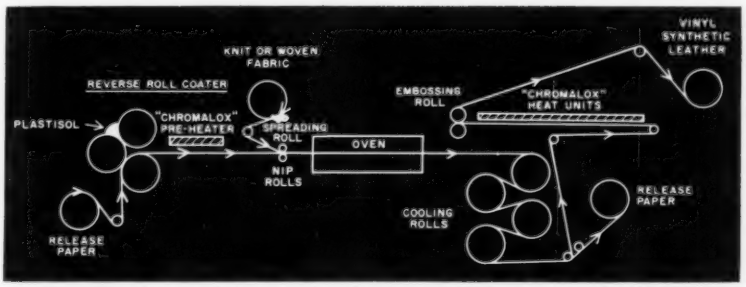
COLORING, BLEACHING, AND FINISHING DEVELOPMENTS

New Foam Process. A new process for laminating polyurethane foam to woven and knit fabrics has been announced by Fashion Textile Laminating Corp., New York. The process, details of which have not been released, is claimed to eliminate warping and distortion of the foam or fabric.

Immunization of Wool. Improved method for partial or total immunization of wool to permit cross-dyeing effects utilizes a resist assistant and pretreatment with peracetic acid, glyoxal, and sodium bisulfite. Cost is reasonable (about 10¢ per lb), time cycle is under three hours, and the color of the treated wool is not seriously affected. The immunized wool is said to resist practically all acid dyestuffs in any depth of shade.

Spot-Repellent Finish for Silk. A New Jersey dyer has announced the development of a process utilizing a fluorochemical finish for silk fabrics to impart durable resistance to water-borne and oil-borne stains. A new type of pre-drying finishing unit of Coronizing glass blocks is said to have made possible the successful application of the finish to pure silk apparel fabrics.

Aluminum Compound Finishing Agent. A new Du Pont Co. product, described as a collodial alumina, readily dispersed in water, may be useful as a textile finishing agent. It is suggested that fixation to the surface of acrylic or polyester fibers affords improved resistance to static, soil, and staining, in addition to modifying the hand. The increased frictional characteristics imparted to knit acrylics and wool-polyester blends are also effective in preventing permanent stretching. Other uses are anticipated in anchoring of certain dyestuffs and finishes to fabrics.



A new process for producing vinyl-foam synthetic leather has been demonstrated by Waldron-Hartig Division of Midland-Ross Corp., developers of the process with the Du Pont Co. The "Nitrosan" process involves the continuous casting and fusing of a vinyl "skin" backed by an expandable plastisol foam. The drawing above shows a continuous line for producing the product. Cost of the equipment is about $75,000 for a reverse roll coating unit 36" wide, up to about $90,000 for a 54" unit. Knife coating units are about $15,000 less.

Stripping Procion Dyestuffs from Cotton. Disclosed in an English publication is a technique which utilizes treatment in boiling 4% sodium carbonate solution for two hours to strip the material sufficiently to permit fluidity determinations and for re-dyeing for testing purposes. Also, hot 40% aqueous hydrazine was found to strip all but one of 20 Procion dyes without degrading the cotton.

Improved Acid Dyeings of Nylon. After-treatment with tannin/tartar emetic is said to be suitable for improving the fastness properties of medium and dark shades on nylon. The dyeings are claimed to resist perspiration and washing with soap and soda ash at 60 C.

New Foam Carpet Backing. Exhibited in England, a new form of foam backing for carpets has a waffle design. The design reduces the amount of foam required to give the desired amount of cushioning, contributing to a lower cost. Application may be after the carpet has been pre-latexed and dried, or direct to the back of the carpet, locking in the tufts.

Vacuum Sublimation as a Dyeing Aid. Japanese research workers report promising results in increasing the dyeability of various fibers substantially by placing them in a vacuum system and heating to 80-100 C. The lower polymers on the fiber surface layers are sublimed and microscopic pores remaining provide more absorbency of dyestuffs. Fiber strength is reduced by 7%.

Plan AATCC Hosiery Division. Plans are under way for the organization of a hosiery division within the Northern Piedmont Section of the AATCC.

Colored Flocked Fabric. Assigned to a New Jersey dyer and printer is a recent U. S. patent disclosing means for obtaining colored patterns on a cellulosic flock bonded to a polyester yarn base fabric. The colored design is printed with a paste containing a reactive dye.

Finishing Polyester Fabrics. Described in a British patent assigned to the Du Pont Co. is means for obtaining a non-embossed silk-like finish on polyester fabrics by Schreiner calendering under 0.2-0.8 tons per inch pressure at 100-350 F, followed by heat setting and treatment with at least 2% of caustic soda solution to achieve a weight loss of 5-25%.

Continued on page 107

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New Dyes and Chemicals

Vinyl Ether Finishes. The first of a series of vinyl ether polymers and copolymers under the name "Gantrez" is now available in semi-commercial quantities. Gantrez AN, a product of General Aniline & Film Corp., comes in three viscosity ranges—low, medium, and high—and is recommended as a finishing agent and fiber modifier. Use in the spin bath improves the dye receptivity, resilience, and water repellency of rayon; in acetate it gives lightfastness and resistance to gas fading. Crisp, durable finishes based on insolubilized Gantrez AN are said to be especially useful for rayon and cotton. Coated on glass fabrics, the finish is reported to provide excellent affinity for vat dyes. It is also recommended in a formulation with a glycol as a warp size for nylon, and as a water-soluble carrier and color value improver for oil-based pigment printing pastes. *(G-1)*

Resin Latex. "X-Link 2833" is a vinyl-acrylic copolymer dispersion claimed to offer advantages in nonwoven fabrics and in finishing operations. According to National Starch and Chemical Corp., the new self-crosslinking resin latex provides strength and softness when used as a binder for nonwoven fabrics, with excellent heat and light stability, resilience, good tear and tensile strength, washfastness, and drycleanability. Alone or in combination with such finishing agents as softeners or resins, the latex is said to produce durable finishes which improve hand and drape and increase abrasion resistance, and tensile and tear strength. *(G-2)*

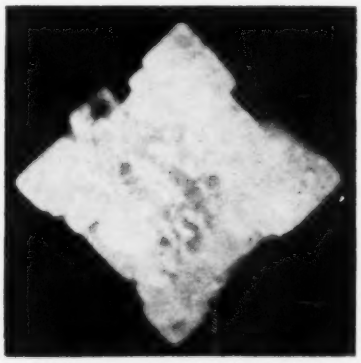
Water Repellent. A new silicone water repellent marketed by Arkansas Co. is called "Hydro-Pruf C." It features high durability, and is compatible with most thermosetting resins and color fixatives. It requires no extra operation or prewashes in application to cottons, and it may be used to make naphtholdyed fabrics water repellent without shade change. *(G-3)*

Antistatic Agent. Buildup of static electricity on various fabrics and plastics is prevented by "Anti-Static Agent 575," a new product of E. F. Houghton & Co. It is applied from a water solution. *(G-4)*

Foam Bonding Agent. Bonding of polyurethane foam to fabrics without fusion is claimed by Manufacturers Chemical Co. for its "Maniflex 789." It is also said to eliminate the usual loss of thickness of the foam. *(G-5)*

Urethane Foams. New urethane foams for laminating with a wide variety of fabrics have been announced by Dayco Corp. Known as Dayco Foam Laminates, they are suitable for application by fusion, adhesion, or quilting techniques. The company now offers all three types of urethane foams: polyester, polyether, and a new super-soft, open-cell type known as Velvet Foam. The latter is claimed to improve hand and drape, and to be especially suitable for laminating to sheer materials because it eliminates the shine or glisten present in other urethane foams. *(G-6)*

This fabric has been treated with "Poly-Em" polyethylene latex, claimed by Spencer Chemical Co. to impart superior abrasion properties, plus excellent durability, compatibility with other treating materials, resistance to scorching, heat aging, and discoloration due to exposure to light. The new latex is recommended as a softener on wash-and-wear fabrics and as a self-finisher on other textiles. *(G-8)*



Salt with a branch or star-like basic form, rather than the cubical structure of regular vacuum pan salt or the crystal aggregates of flake-type salt, is now being marketed by Morton Salt Co. "Dendritic Salt" is said to have a fast dissolving rate, to make an ideal blending agent, to have a low weight per unit volume, and to have excellent storing qualities. *(G-7)*

◆ *For more data on any of these dyes and chemicals, write supplier or use postage-free card on page 149, listing in space provided the code (G-1, G-2, etc.) in parentheses at end of descriptions.*

Drycleaning

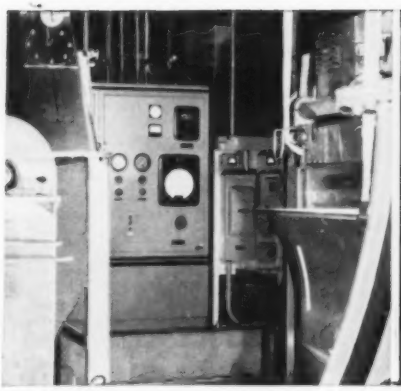
(from page 101)

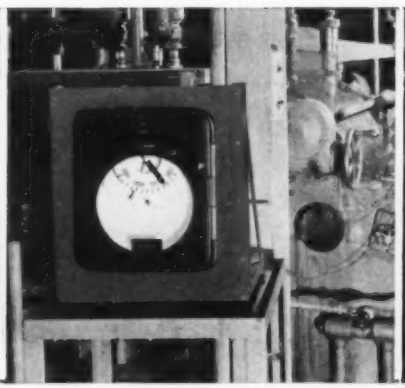
No. 85-1960, which has been adopted by the AATCC, is a reliable guide for the performance of resin-bonded pigments in any perchlorethylene cleaning operation. This test has revealed that many pigments, which performed satisfactorily under previous tests, have fallen down under its more severe conditions. At least one manufacturer of resin-bonded pigments is developing a wider range of colors which now meet the severe conditions of this test.

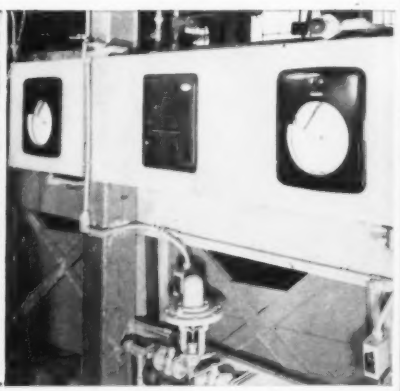
Some textile merchandisers already view low-cost drycleaning with some favor, since there are many fabric blends and categories of apparel which lend themselves more favorably to drycleaning. There may now be a shifting emphasis in consumer education, through labeling, pointing out the benefits of drycleaning certain fabrics as being the best means of preserving aesthetic qualities.

No doubt the economics of coin-operated drycleaning are very appealing to the consumer; and the claim is being made repeatedly that the new machine has been designed to leave the garment wrinkle-free, with creases, pleats, and ruffles intact. These two features, together with a saving in time, are enough of an impetus to start a new trend in maintaining textiles.

Conductivity, Redox, Foxboro Dynalog* record and control







Conductivity Control— This mill uses a Dynalog electronic Concentration Controller to hold souring bath acid strength within ±0.025% concentration of sulphuric acid. Controller has a range of 0 to 2.5 percent sulphuric acid. Operation is simple. Operator sets desired acid strength on the controller and walks away. Foxboro does the rest — automatically and continuously feeding a smooth flow of acid to the bath. Write for a copy of data sheet 220-181.

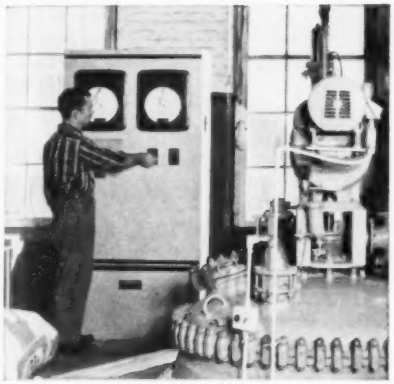
Redox Measurement—One example of the importance of Redox measurement and recording is seen on this continuous dyeing range. A Foxboro Dynalog continuously measures, indicates, and records oxidation reduction potential in Williams Unit, resulting in better shading at higher temperatures and speeds, savings in Hydro and other reducing agents, plus other important advantages. Write for copy of Bulletin 19-12.

pH Control — This large bleachery finds that relatively minor variations in pH affect the efficiency of final neutralizing of cotton cloth. pH Controller (right) continuously measures bath pH — operates valve in the incoming aqueous ammonia line to keep solution at optimum pH. Write for data sheet 220-32.

*Reg U S Pat Off.

For further information use Handy Return Card, Page 149

pH, Viscosity... instruments let you them all...



Viscosity Control—This finishing mill counts on a Dynalog Viscosity Recorder and Dynalog pH Recorder to insure perfect repeatability in the "batching" of urea-formaldehyde resin. Viscosity transmitter spindle, rotating in resin solution, transmits a continuous electronic signal directly proportional to the centipoise viscosity of the resin. Recorder tells when corrective action is required — prevents batch from being ruined. Write for data sheet 220-210

continuously, automatically... and with minimum maintenance

You'll find Foxboro Dynalog Electronic instruments handling complex measurement and control tasks everywhere in the textile industry.

Dynalog instruments give higher sustained accuracy and greater freedom from maintenance than conventional potentiometers. That's because the Dynalog design has no slidewire. Instead a simple, variable radio-type capacitor, with silent magnetic drive, gives stepless continuous balancing, smooth faster response without waste motion or wear. In addition, Dynalog instruments are free of drift — require no standardization, lubrication or alignment.

Investigate sensitive Dynalog recorders and controllers. They can be used for any electrical measurement . . . resistance, voltage, capacitance. Write for Bulletin 20-10 and detailed engineering data sheets. The Foxboro Company, 487 Neponset Avenue, Foxboro, Mass.

Typical Dynalog Applications in the Textile Industry

- Chemical dilution of acetic, sulphuric, and muriatic acids; caustic; hypochlorite; and others
- Dye kettles
- Continuous dyeing
- Resin batching
- Wool shrink proofing
- Desizing and bleaching
- Thread bonding
- Souring and causticizing
- Carbonizing
- Coating machines
- Condensate return
- Water and waste treatment
- Sizing Plissé machines

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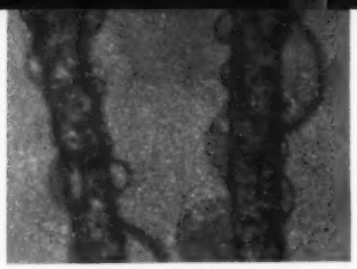
How nonionic compounds aid level dyeing

■ DYERS know that many surface active agents have definite cloud points—i.e., when their aqueous solution reaches certain high temperatures the clear dye bath suddenly becomes cloudy. Under the Microdyeoscope, dye baths containing certain nonionic compounds reveal this: Shortly after the cloud point is reached, the fiber is bombarded with tiny globules of the nonionic agent which are separated from the water phase. Striking against the fiber and against each other, some of these globules increase in size. Small to large globules move along the fiber or attach themselves to it, holding on tenaciously and competing with the fiber for the available dye.

Another important way that these nonionic compounds function is to react with the dye by means of Vander Wall forces, forming loose aggregates which retard the rate of absorption by the fiber. With sufficient time at higher temperature, these



Globules of nonionic surface active agent, attached to wool fiber, in dye bath of 2% Calcofast Wool Bordeaux RB Conc., 5% sulfuric acid, 2% Deceresol NI Wetting Agent, 212 F, liquor ratio 40:1.

colored globules give up their dye to the fiber and become colorless. Thus, the cloud-point globules act as reservoirs of dye. In the case of wool, for example, increase in time and temperature gradually increases the fiber's affinity for dye, and decreases the holding power of the nonionic agent. Dye is released by the globules and absorbed by the fiber.

If the period at the boil is sufficiently prolonged to exhaust the dye from the globules, and the dye bath then is allowed to cool slowly to a temperature below the cloud point, the globules gradually become smaller and finally disappear.

The nonionic surface active globules also cause deaggregation of cationic-dye globules, which gradually decrease in size until they finally slough off, leaving a clean fiber surface.

Dirt and other extraneous materials, including precipitates of dye, are also removed from the fiber surface by this "bombarding" action of nonionic compounds.

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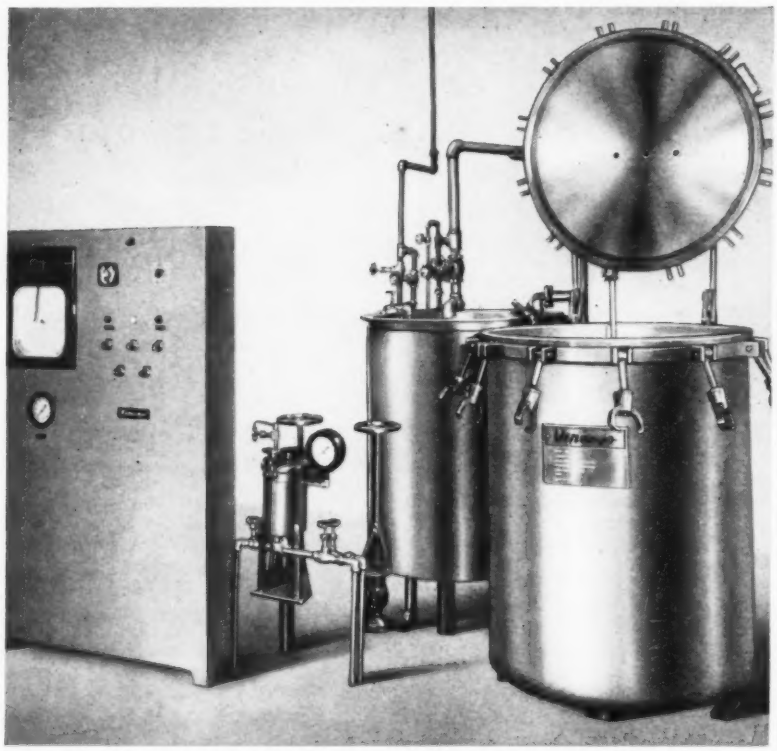

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Custom dyeing

(from page 94)

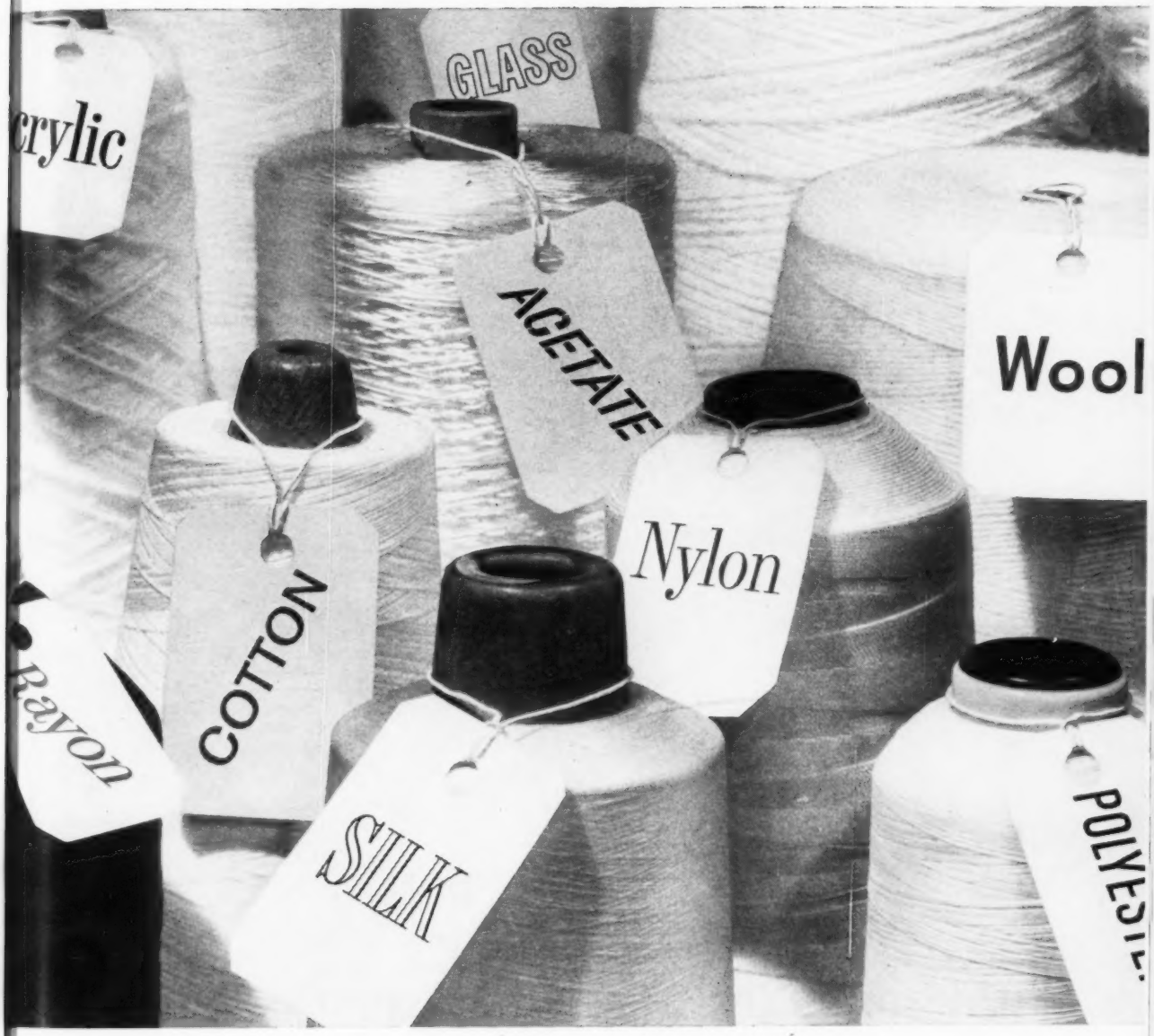
piece, and as it travels to an overhead oven, infrared lamps are used to tack the scrim on before the goods enter the steam heated dryer.

Finishing. One part of the finishing department is for stock dyed goods which are run into a bath of cold water, through a squeegee, back into water, and squeezed again to assure maximum saturation of yarns for maximum shrinkage and stabilization. A Birch calender is used, and it handles widths up to 15 ft.

After this, the carpets are put into tumblers for drying. Each tumbler holds two rolls (75 to 100 ft per end), and the steam-heated

For further information use Handy Return Card, Page 149

every fiber, every fabric, benefits from the new finishes made with A-C Polyethylene



The new textile emulsions now being formulated with Allied Chemical's A-C® Polyethylene benefit *every* fiber—natural or synthetic—in one way or another over other finishes.

Take wash-and-wears, for example. Here, A-C Polyethylene overcomes loss of hand and tear strength when used as a softener along with conventional resins.

Emulsifiable A-C Polyethylene is permanent through multiple cleaning cycles. It increases abrasion resistance and tear strength . . . imparts extra crease resistance and better sewability.

Your textile chemical supplier either has an A-C Polyethylene finish on hand or can formulate one for your specific use—suitings, dresses, hosiery, curtains, rugs, upholstery. (We make A-C Polyethylene, not finishing emulsions.) Or write for complete information to: Plastics Division, Dept. 613-TI, 40 Rector St., N.Y. 6, N.Y. In Canada: Allied Chemical Canada, Ltd., Montreal.

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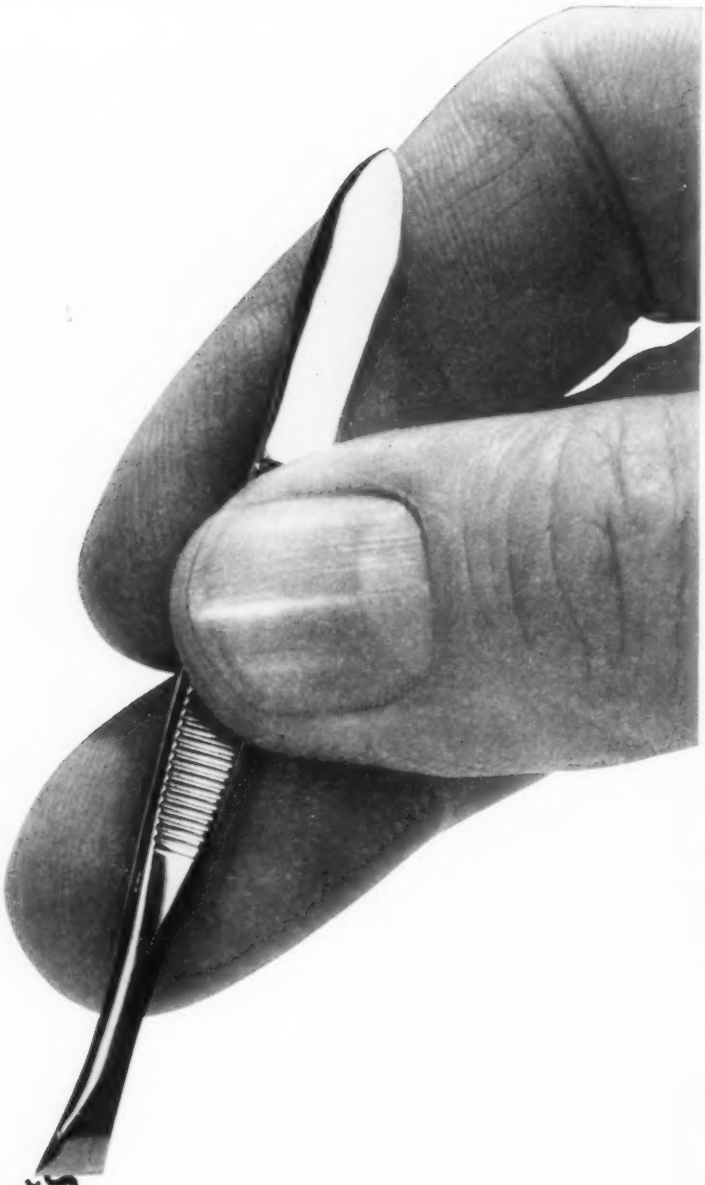

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CHEMICALS DIVISION Olin

For further information use Handy Return Card, Page 149

tumblers dry the carpet in 2-3 hours. After tumbling, final inspection and packing operations are done (except for coated fabrics).

Tufted goods are piece dyed in the beck in open width. It takes about seven hours to dye a roll of nylon carpet.

In custom dyeing, a swatch is cut from the dyed carpet, dried, and matched again with the lab swatch to adjust the dye bath for an exact match. Swatches are cut from the sides and center of the carpet. After dyeing, the carpet is tumble dried.

All carpets are inspected three times. For woven carpets, inspections are made at the loom, after tumbling, and after coating. On tufteds, the first inspection is immediately after tufting, the second after tumbling, and the third after coating. Tufteds are sheared after coating.

Carpet Success Story. The plant has grown under the guidance of W. W. Pate, Sr., president and founder, from 1,800 square feet of floor space in 1947 to 111,500 square feet, not including warehouse. Sales in broad wovens have increased from $271,000 in 1947 to about $9,000,000 in 1960.

Wunda Weve built success on consistent quality as a first consideration. Quality is maintained to rigid standards for weight/yard, picks per inch, pile height, visual appearance, wear characteristics, and cost. All of these attributes are balanced in the carpets produced so as to give value and performance to the customer.

Before a new carpet is put on the market, a room-size sample is put into the foyer and main entrance to the mill to observe wear characteristics, soiling, and cleanability. The sample is left there for about a month during which time it receives as much wear as it would in two years of home use. After passing this test the sale force is asked for an opinion. If they think it might make a market impression, the carpet goes into production.

A designer, colorist, and a yarn specialist work on a full-time basis developing new fabrics and colors. The custom dye service offers prospective customers the privilege of owning any color carpet of their own choice.

The company is currently in a $1,448,000 expansion program, including construction of three additions to the plant and production facilities, installation of additional equipment, and a substantial increase in key production, research, development, and sales personnel.

*As we went to press, Wunda Weve announced that installation of a complete custom carpet production unit was nearing completion at its Greenville plant. The new unit was reported to represent an investment of $100,000.

Cross-linking: Wash-and-wear without resins

by Sanford P. Young
President
Young Chemicals, Associated

Extract*

■ DURING THE past three years, we have all had increasing exposure to the term "chemical cross-linkers," and a great deal of excellent work has already been done in this area in an effort to impart wet memory to cellulosics. In the early stages of this comparatively new facet of wash/wear, it was felt that wet cross - linking when carrried on, as the phrase implies, in the wet state, would improve only the wet crease recovery. There are new developments now being commercially offered that do not entirely corroborate this early-formed postulate.

It certainly seems to be the notion that simple chemical monomers which can be used as direct cross-linkers in cellulose are inherently cheaper and more efficient than the resinous or polymer-forming materials which are commonly used in finishing today. This, of course, is the major appeal of epichlorohydrin, formaldehyde, and divinyl sulfone.

To do this job of cross-linking, these chemicals are about as simple in molecule structure as one can imagine but processes for using them are new. Although the chemicals themselves are relatively inexpensive, it should be remembered that the methods for the treatment of cotton with these type materials is comparatively involved. Consequently, because of the sophistication of the treatments and resultant cost incurred, such finishes are relatively expensive.

Wet crease recovery produced by wet cross-linking the cellulose when wet, with a product such as epichlorohydrin, is ordinarily carried out by padding the fabric through a solution of caustic soda, then soaking in the di-functional cross-linker, where the cross-linking reaction took place. The wet crease-resistant properties that resulted were indeed high, but concurrent with these high wet crease angles was an extremely high tensile and tear strength loss. Also, the dry crease resistance left much to be desired. Therefore, it was found necessary to resin-treat the fabric either before or after the wet cross-linking reaction, in order to impart an acceptable dry crease resistant effect.

The Deering-Milliken Research Corp. has indeed been one of the early pioneers in this field. Their "Belfast" process has already received widespread reception. Being a very progressive organization, I would anticipate that they are continuing to study and make new improvements in this field.

Sulfone Chemistry. One of the very newest and perhaps one of the most exciting developments in the chemistry of cross-linking reactions is in the field of divinyl sulfone and sulfone chemistry generally. One large textile organization, J. P. Stevens, has done a tremendous amount of research and development work with sulfones. To date, however, they have made no announcement indicating that they have commercially processed and marketed any fabrics with this kind of chemical cross-linking agent, and consequently, it is difficult to ascertain just what their commercial success will be.

However, in very recent months, Monsanto Chemical Co. with their RTF-64 (now tradenamed Retane), and General Aniline & Film with their Ganalok-A-14, have been doing a tremendous amount of work in this cross-linking field. Although neither company has made a public statement to confirm this fact, it seems to be a conservative guess that both of these two materials are in the general sulfone chemistry field.

This therefore, means that neither contains nitrogen or formaldehyde, and therefore is free

Continued on page 136

*From a paper presented at a symposium sponsored by the National Association of Shirt, Pajama, and Sportswear Manufacturers.

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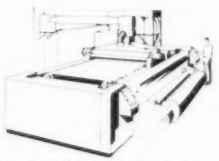
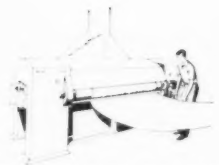


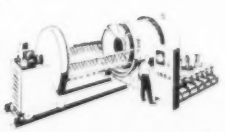
Excess handling is eliminated and shearing costs are reduced for carpet manufacturers through the Turbo Cross Shearer.



Turbo Electro-Finisher gives woolens, wool-blends, high pile and fur-like fabrics rich vibrant lustre and soft appealing hand.

For hosiery, the Turbo Dye Boarder combines preboarding, dyeing, post boarding, and drying in one processing operation.

The Turbo Package Dyeing Machine is one of a complete line of engineered machines for dyeing, drying, extracting, and finishing.



Yarns and fibers are heat set in Turbo machines with capacities from 1000 lbs. (illustrated) to 60 lbs. per cycle.

Sweaters are "set for sales" on the tray-type Turbo Fiber Setter.

High bulking on Turbo Staplers, and Turbo Fiber Setters is the shortest route to synthetic fiber spinning.

TURBO

KNITTING SECTION

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Diversification and good management got it for this ladies' hosiery mill

Staff prepared Exclusive

WITH NEW management for a Yanceyville, N. C., full-fashioned hosiery mill came . . .

. . . a new name
. . . a new 4500 sq ft addition
. . . new equipment for manufacture of seamless hosiery
. . . more profit for the owners

Early in 1959 Roy V. Atwater, one of the organizers of the Cole-Gunn Hosiery Mills, Inc., which was established in 1948, obtained substantial interest in the firm that he had left in 1953. Name of the company was changed to Royal Hosiery Mills, Inc., and

Seconds are minimized by inspection of every stocking as it comes from the knitting machine; hence faulty machine operation, bad yarn, or improper knitter technique can be quickly discovered and corrected.

(ADVERTISEMENT)

QUALITY STOCKINGS vs. TUBE STOCKINGS

• Recent advertisements, announcements and showings of four-feed circular knitting machines for the production of fine gauge seam-free nylon hosiery have caused considerable speculation and concern over the profitable future of the ladies' circular hosiery division of the industry

• The National Association of Hosiery Manufacturers, on the front page of its official outlet, "The Hosiery News Letter", of May 19, has effectively expressed its fears of what could happen to the industry should these multi-feed, single-purpose machines sacrifice quality for false economy. Scott & Williams commend "The Hosiery News Letter" on its timely and pertinent editorial, which is particularly in keeping with the purpose for which the Association was formed.

• As leading builders of knitting machinery, we shall, as in the past, continue to devote our efforts toward serving the industry and improving our product, while keeping quality foremost in mind.

• Nylon and the Scott & Williams K machine, with assistance from a few far-sighted manufacturers, made the seam-free hosiery industry what it is today.—QUALITY.—PROFITABLE.—

• There is no better machine for the production of quality hosiery than a single-feed machine. Except for initial investment this single-feed machine is the most economical to operate per stocking and with it uniformity of production and quality are readily maintained.

• There is nothing new about knitting "tube" stockings. It has been done periodically for several years by one manufacturer or another without any degree of success. FIT and COMFORT, so all important to our ladies, are overlooked when knitting "tubes" and boarding them to shape. The use of a true "heel pocket" permits proportioned "fit" at the ankle, instep and in the foot. When boarding-in a heel pocket of a "tube", the nylon fabric is stretched to its elastic limit across the heel and ankle, resulting in "non-elastic" fabric, or tight wrinkling at first wearing and "bagginess" with continued use. Also, due to many variations in finishing and boarding techniques, the linear fit of a "tube" stocking is more difficult to control.

• A few foreign hosiery manufacturers are promoting "tube" hosiery and refer to the stockings as "disposable". In spite of this, sales for standard hosiery knitting machines continue in volume to leading manufacturers who have no desire to knit the "tube" stocking, even in the foreign markets, and the Scott & Williams All-Multi-Feed (two-feed throughout), which knits a conventional stocking in 8 minutes is highly favored.

• Every mill man knows that a "tube" stocking can be knit on conventional ladies' circular hosiery machines. A simple change in existing machines to a point where the parts necessary for reciprocal knitting of heel and toe are inoperative or removed, results in a saving of knitting time. The big advantage here lies in the fact that the machine is NOT a SINGLE-PURPOSE machine as are the four-feed machines being offered, but can be changed back for the knitting of conventional stockings in a relatively short time. As a comparative example, a KN single-feed machine will knit a full-length CONVENTIONAL stocking in approximately 16 minutes. The same machine will knit a "tube" stocking of similar length in 12 minutes, or at a saving of 4 minutes. Mill men also know that by disconnecting or removing the reciprocating mechanism the head speed of the machine can be appreciably increased. Actual tests show that an increase of 20 RPM will result in an additional saving in excess of one minute. Similarly, a KN-II machine will knit a CONVENTIONAL two-feed stocking in approximately 10 minutes and will knit a "tube" in 6 minutes or less; and the All-Multi-Feed machine mentioned above, because of its sturdy construction and precision engineering, will knit "tube" stockings at speeds which will result in still further savings.

• We disagree with a statement published recently indicating that a four-feed "tube" machine could equal three times the production of a dual-feed seamless knitter, for if the latter machine had the heel and toe mechanism disconnected, the production, at best, could only be doubled. Actually, the production because of normal down time would not be twice as much, for when the four-feed machine was idle, the double production would be lost.

• In comparing the production of the KN-II or the All-Multi-Feed with that of a four-feed "tube" machine, there are certain pertinent factors which must be considered. Assuming that the four-feed machine will knit a "tube" in a given time, the KN-II, with the heel and toe mechanism disconnected, will naturally require double the time to knit a similar "tube", and the same applies to our All-Multi-Feed machine. However, it must be borne in mind that the four-feed machine is designed for a SINGLE PURPOSE, producing only "tubes", while the KN-II and All-Multi-Feed are versatile machines capable of producing GENUINE, WELL-FITTING hosiery of HIGH QUALITY whenever desired. It should also be realized that part of the saving in time is lost, as the number of "tubes" produced in a given period is affected by down-time, and neither the KN-II nor the All-Multi-Feed should be idle for servicing more than half the time expected in a four-feed "tube" machine. Consequently, what on the surface might seem to be a saving, in practice, may not actually prove to be so, for the time a four-feed machine is out of service represents a loss in production greater than that of two dual-feed machines. Furthermore, this small saving in time is additionally offset by the fact that the number of machines a knitter and fixer can care for in knitting four-feed "tubes" will certainly be less than in the case of the KN-II or All-Multi-Feed machine if knitting similar "tubes". A mill should, therefore, carefully consider the possibility of increased rather than decreased operating costs, when all factors are taken into account.

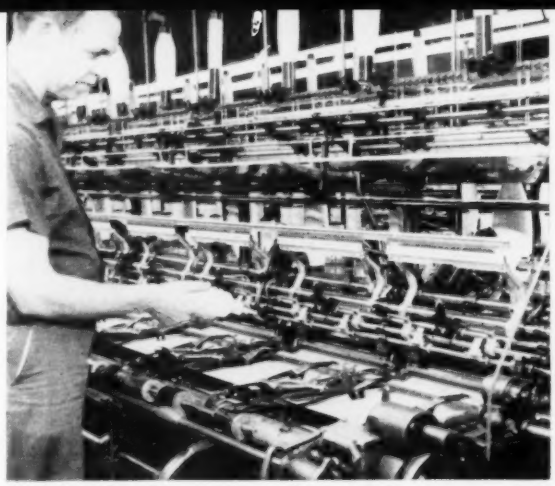
• In our opinion, hosiery manufacturers who have long been associated with a quality market and have conducted extensive advertising campaigns will hesitate before investing in additional, more expensive, single-purpose, four-feed machines.

• Finally, "tube" stockings CANNOT BE CAMOUFLAGED to the buyer and we do not believe they will be accepted in the American market, nor will they, in the long run, be a satisfactory or profitable item for any American mill to produce; and, furthermore, we feel that such hosiery can only be sold at a price probably below any possible saving in the cost of manufacture.

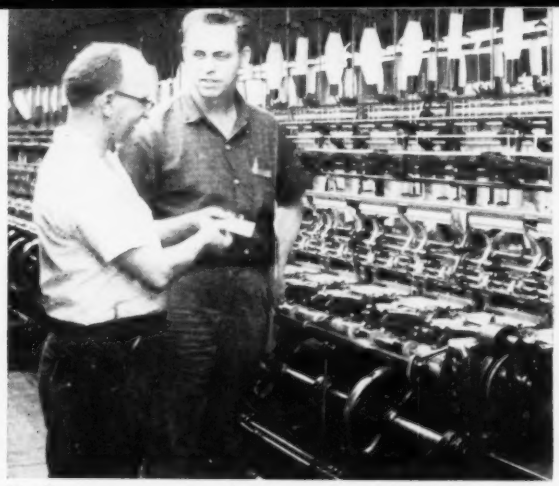
Richard H. Whitehead

President
SCOTT & WILLIAMS, INC.
Laconia, New Hampshire

For further information use Handy Return Card, Page 149



Full-fashioned machine needles are lubricated three times per shift.



Needle consumption is only one per ten dozen pairs of hose.

Mr. Atwater was elected president.

Soon thereafter an expansion program, which would permit the mill to manufacture ladies' seamless hosiery (as well as full-fashioned), was launched. Plans were to increase production capacity from 3,000 dozen pairs weekly to 6,000 dozen—half full-fashioned and half seamless.

Since the existing mill building would not accommodate the equipment required for making seamless hosiery, an addition was constructed which would provide 4500 sq ft more space. Completely air conditioned just as the original plant, the new facility was completed late in 1959 and rearrangement of machinery started.

Seaming and inspection equipment was moved into the new area so the seamless machines could be installed in the same room with the full-fashioned units. The additional space needed was obtained by disposing of two of the twelve full-fashioned machines.

With machinery relocation completed, seamless equipment was installed. There are 108 circular knitting machines—60 Scott & Williams 400-needle, single-feed units and 48 Fidelity 400-needle, two-feed units. New 40-point loopers for closing the toes of the seamless stockings are located in the new addition with the seaming, inspection, and shipping departments.

The ten full-fashioned machines are "Reading" fully automatic 30-section units, four 51 gauge and six 60 gauge.

Since completion of the expansion program last year, production has increased as contemplated. In 1959, when Mr. Atwater returned to the mill, output was about 2,000 - 2,500 dozen pairs weekly with 45-50 employees and a payroll of $3,000. Now production, employment, and payroll figures are double those of two years ago.

Quality Control. Royal Hosiery Mills' profitable production of top quality goods is possible because of the good equipment, efficient supervision, and cooperative employees. Control of in-plant costs is maintained by the supervisors who watch production closely. An accurate account of all defective goods made is kept by supervisors of each operation and a coordinator for all departments. Trouble spots are quickly located and corrected.

The air conditioning system maintains atmospheric conditions at 82 F and 50% RH to facilitate processing of goods.

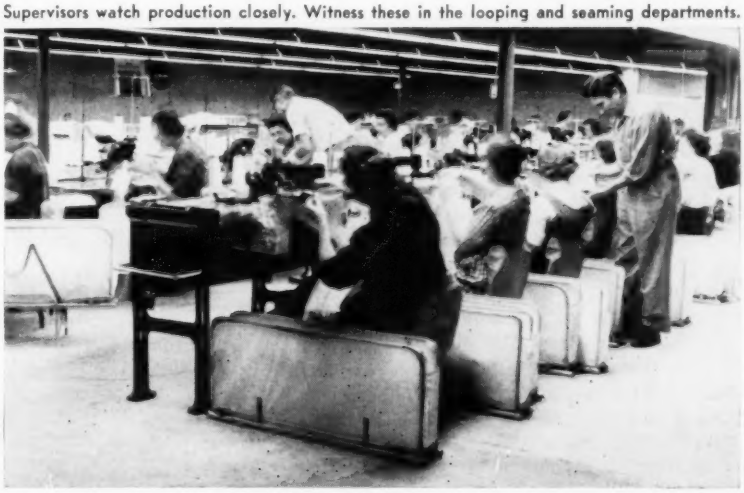
Maintenance. An informal maintenance program is based on actual needs. Lubricants and needles are major items which contribute to maintenance cost.

On full-fashioned machines needles are lubricated three times a shift; the remainder of the parts, once a week.

Seamless machines are lubricated once a day, with some parts receiving attention once a shift.

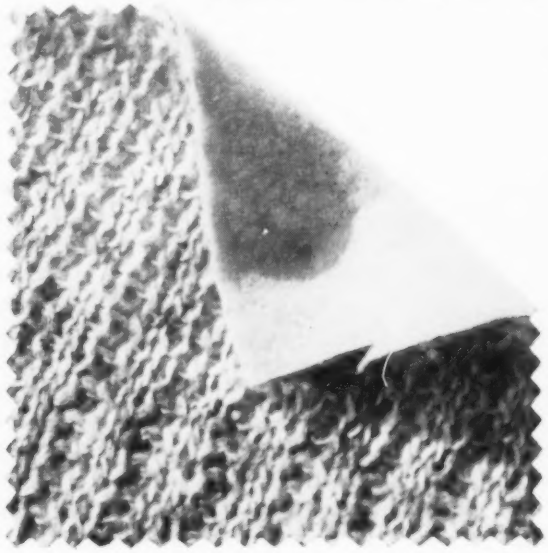
Needle consumption on full-fashioned machines is only one needle per ten dozen stockings produced; on seamless machines, which operate three shifts a day, six days a week, one needle per eight dozen.

Supervisors watch production closely. Witness these in the looping and seaming departments.



Double jersey knits have excellent drape and shape retention, while at the same time they simulate the appearance of a woven fabric.

Biggest recent development in knits is the foam laminate—light in weight, with warmth, improved dimensional stability, and body.



KNITS . . . growing

Double jerseys, laminates, and resinated tubular knits are making a strong play for traditional woven-fabric markets

Staff prepared Exclusive

OF THE many trends that were in evidence at the Knitting Arts Exhibition this year, of interest to outerwear, underwear, and hosiery manufacturers, there were three of growing significance to the textile industry as a whole, signaling in particular an increasing competition to woven fabrics.

On display in large numbers were circular knitting machines, of foreign and American make, for the manufacture of so-called double jersey yard goods, a unique class of fabrics in which the beneficial properties of woven and knitted structures are combined.

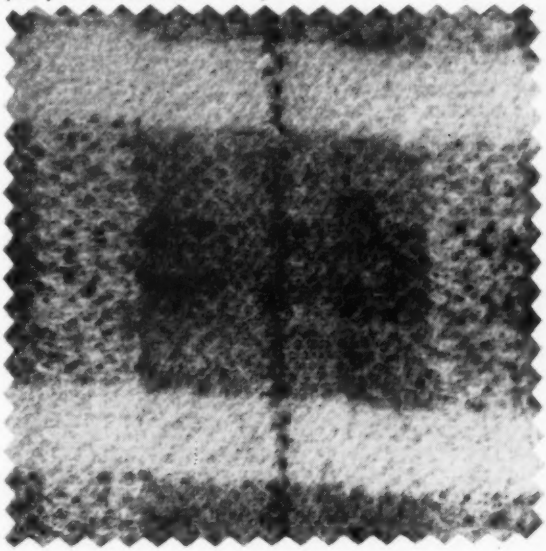
And much in evidence in fabric displays was the foam laminated knit, which exemplfies a totally new concept of fabric manufacture. The urethane foam, which is laminated to the fabric (by heating or adhesion) can provide function and warmth—and quite possibly other properties not yet realized — while simultaneously reducing the weight of the garment. To be sure, lamination is not restricted to the knit fabric, but it is likely that the knitting industry will capture a large share of the markets, whose potential and diversity have not yet been exploited, by virtue of the broad styling possibilities that knitting technologies, fibers, and yarns can offer.

In a third area — in finishing tubular knit goods — there was clear evidence that this industry is advancing steadily. Though its output is dwarfed by the high production of the woven fabrics industry, the introduction of permanent finishes has given it much impetus. While only a few machinery manufacturers displayed equipment for finishing tubular knits, it was interesting to observe that a trend toward higher processing speeds is taking place and research is being done to develop improved equipment.

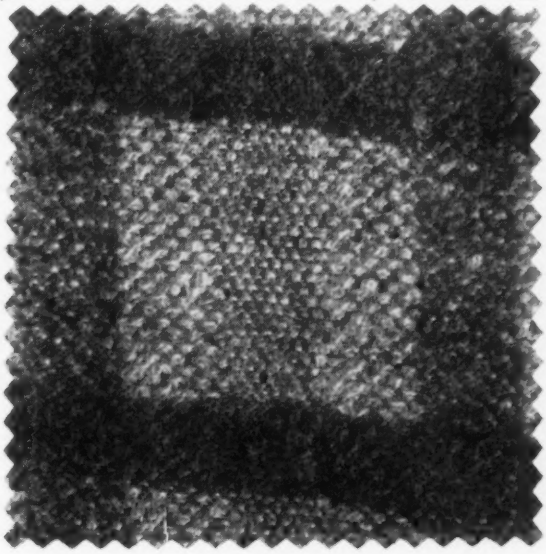
Woven Appearance. The so-called double jersey fabric cannot be considered a new development since it has been popular in Europe for many years. However, there is a clear indication that its popularity in this country has now been assured, for among the machines on display, of sinker top and cylinder and dial design, there were many American models. Fabrics in this class can be produced in an infinite variety of designs, including Jacquards, at increasingly higher speeds.

It has been estimated by a machine manufacturer that there are now approximately 300 machines of these types in this country, most of them of foreign make, producing "woven-like" fabrics in weights suitable for the higher quality dress, suiting and upholstery markets. It is of particular interest to note that a major fabric producer in this country recently entered this field with a sizable number of double jersey

Two samples below have striking similarity in appearance to higher quality woven fabrics, retaining desirable knit-fabric qualities.



Both fabrics below were produced from 1/26 and 3/26 worsted yarns on Scott & Williams LPW sinker top machines, 18 cut.



competition for wovens

machines.

Perhaps the chief characteristic of these fabrics is that they retain their original shape throughout prolonged wear. And they require no lining when made into dress-wear.

Foam Lamination. No other development in recent years has grown as rapidly as the foam laminating technology. One of the more conservative prophecies heard at the Exhibition, indicating the growth of this field suggests that about 2,000,000 pounds* of polyurethane foam will be used this year in the manufacture of garments. When it is considered that a linear yard 3/22" in thickness weighs only 2 ounces, it is easy to visualize the huge markets that apparently exist for foam laminated fabrics.

The urethane foam has many interesting properties. In warmth, it is equal to textile fibers. It has air permeability; it can be laundered and drycleaned. And most important, it adds body without weight. While it does improve the dimensional stability of knit fabrics, it is not a complete cure for the shrinkage problem.

To the knitting industry this development is particularly significant, since fabrics of lighter weight and of constructions which by themselves are unsuitable for use, can be transformed (by attachment to foam) into useful garments. At the present time, foam laminated knits are finding a chief use in outerwear markets, where they offer warmth at considerably reduced weight of the garment. But according to one technologist close to this field, the complete utilization of urethane foam and realization of its properties have not yet been achieved.

Tubular Knit Goods Finishing. By comparison with the woven fabrics finishing industry, the output of tubular knit goods represents only a small percentage of over-all markets. But in recent years this industry has received more than one stimulus to make for a steady and quite perceptible growth.

The application of resins and other permanent finishes has now become a reality, and finishes are being developed continually by a chemical industry that recognizes market's potential for knit fabrics with improved dimensional stability. Together with the advances in resins and finishes there has been a steady flow of improvements in processing equipment for their application.

At the Exhibition there was evidence that practical research is being done to bring about improvements in quality of finishing with accompanying higher speeds of processing. As in woven fabrics finishing, continuous processing is also possible.

Among the various pieces of equipment on display, there was a pad-extractor of three-bowl, horizontal design (Tubular Textile Machinery Corp.) capable of operating at 100 yards per minute; and a pad-extractor of conventional but improved design, introduced by Turbo Machine Co. The ma-

*Note: This is an ultraconservative estimate. One major producer of foam predicts that consumption this year will be 11-12 million pounds (90-100 million yards).

chinery manufacturing industry has already made available drying and curing ranges for the application of resins and other permanent finishes.

New Stature for the Knitting Industry. The three technologies which have been briefly reviewed here—in knitting, in a new concept of fabric manufacture, and in finishing—are already well established. Their growth is assured. They have given the knitting industry a new stature and a strong position in apparel markets through a diversity unlike any the industry has known in the past.

To the woven fabrics industry, however, they pose important sources of competition, so much so that the more progressive woven fabrics producers have already entered selected knitting fields.

Executive views *(from page 29)*

ed, 'you blank-blank traitor,' and hung up. Others called me a dirty Communist stooge. Needless to say, none of them gave his name. What worried me most was that some alluded to me as a blank-blank Jew and said that Hitler was a great man and history will prove that he was right."

We have no intention of going into an oration about Freedom of Speech and the fact that there comes a time when every man must stand up and be counted. Most of us, we hope, are in agreement on basic principles.

What does bother us, and what is the point of all this, is that we hear on good authority (in some cases the best of authority—the individuals themselves) that some textile officials are members of the Birch Society, and in at least one case even hold office in it. And some of these men also hold office in one or another of our textile associations.

Now we do appreciate the frustration and anger with which many businessmen view this country's drift toward a Welfare State economy. And we deplore it with them. But we do not agree that the solution is to throw out the baby with the bath water.

And we feel that the textile industry has enough troubles as it is, without having to cope with the additional notoriety we receive when some of our prominent spokesmen stand up and get counted with the lunatic fringes of our society.

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is the rule

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A bedspread is not a carpet

In our offices there are two pieces of tufted carpet. One covers the floor completely; it's dense, soft, lovely, and rugged. The other, a swatch just big enough to keep a coffee cup from scarring the desk, is thin and sleazy. It's also soft, but in an unlovely way.

The carpet on the floor is so dense that the pile can't be parted enough to get a look at the backing. It rests on a felt pad. The sample on the desk is so bald that the back had to be camouflaged by dyeing it and the wispy cut pile in the same bath. Without its wafer-thin layer of foam rubber, you could see right through it.

Granted that both these carpets were made to sell, at a price, it is tragic that they are both called tufted carpets—the industry has another prejudice to live down. Lathering a bedspread with a thin coating of rubber and selling it as tufted carpet may well be the limit of downgrading.

We have to agree with Jay Fesperman's prescription for tufting success (TEXTILE INDUSTRIES for May 1961, page 75)—planning. And we have to agree with R. E. Hamilton, executive vice-president of the Tufted Textile Manufacturers Association, who, in his report to that organization in late May, said that Jay's "harsh words" do not apply to the whole industry.

Jay very bluntly said the industry botched its chances for prosperity during the best business eras that this or any other country ever saw.

No doubt the cheap carpet somewhere finds a buyer who can't afford anything better. And of course there's a profit in it—but it's identified with the tufting industry. This leaves us with mixed emotions—like the man who watched his mother-in-law drive his Cadillac over a cliff.

Maybe the bedspread carpet is only a bit of unsound planning that will go away (or change its identity) if we close our eyes long enough. But as long as it's around it invites tufters to compare their better lines with it . . . and take out a little more pile . . . use cheaper grades of backing . . . color the backing to keep it from mocking them . . . apply foam backing to low-grade carpets.

There is only one sure way that tufters can make that nightmare go away—to channel their ingenuity in another direction; adopt a classic as a criterion, and bemoan any departure from it. It doesn't take much to make a poor product—only a lack of concern for the future of the industry.

G.H.D.

For further information use Handy Return Card, Page 149

Too many narrowing defects?

Use the corrective and preventive measures presented here to keep them at a minimum

by R. D. Brackett
Exclusive

MANAGEMENT of full-fashioned knitting mills may expect a small number of narrowing defects, but an excessive amount is cause for alarm.

Steps should be taken to minimize these defects. Here's how:

Trouble at One Head. The first step is to make sure the needles and narrowing points are properly spaced and aligned.

Check the narrowing finger and see that it is properly positioned in relation to the sinkers and dividers.

Points, needles, sinkers, dividers, or knock-over bits should be checked for flaws; in some cases they should be replaced with new ones even though a flaw is not visible. Defective and improperly pliered needles cause the most narrowing menders.

Narrowing points must be straight up and down. Check to be sure the points are not pliered either to the right or left by placing a needle card behind the finger and using the inside edge of the finger as a guide to sight and straighten the inside point. Straighten a few new narrowing points and put two or three of these on each side and in the center of the finger. Then plier all the remaining points to these new points, beginning with the first inside point. This procedure will insure that the points are neither too far to the right or left nor too far forward or back.

With the narowing finger table gauge, check several fingers on each side of the one giving trouble to be sure that the narrowing mechanism itself is in proper alignment. Next, check the troublesome finger by using this same gauge. Should the points be too far forward or too far back, correct them by removing the finger from the narrowing rod and filing either the top or bottom of the slot that fits onto the narrowing rod. Determining whether to file the top or bottom of the slot depends on whether it needs to go forward or backward.

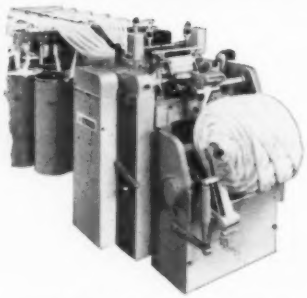
Next, replace the finger; then with the machine in the narrowing motion bring the points down until they start into the sinkers and dividers, and center them with the sinkers and dividers.

Continued on page 135

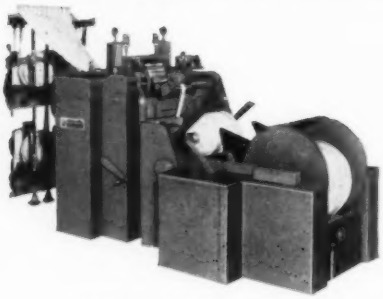
A primary source — improperly pliered needles.

THE WARNER & SWASEY INTERSECTING DRAW FRAMES

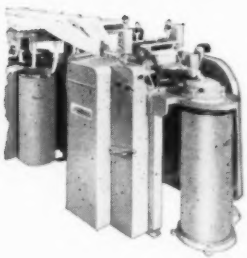
SINGLE HEAD PIN DRAFTERS WITH 6" AND 8"



Single Ball Delivery—Delivers a ball up to 18" x 24", weighing up to 50 lbs.



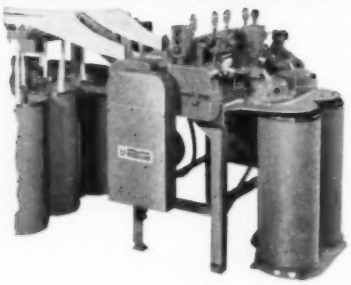
Automatic Ball Doffer—Delivers a ball up to 18" x 24", weighing up to 50 lbs.



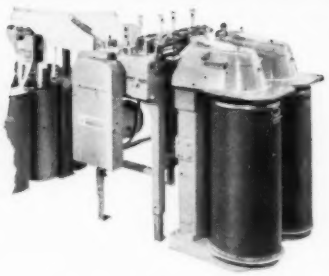
Single Can Delivery—Available with 15" x 36" and 15" x 42" cans.

DUAL HEAD PIN DRAFTERS WITH 6" FALLER

Dual Ball Delivery—Delivers a ball up to 18" in diameter, 10" to 15" wide.



Dual Can Delivery—Available with 15" x 36" and 15" x 42" cans.



Dual Can Delivery—Available with 18", 20" or 24" cans up to 48" high.

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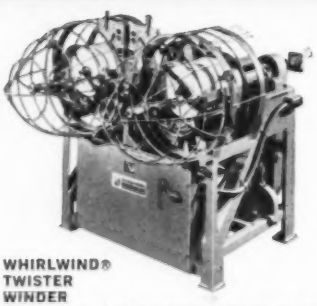

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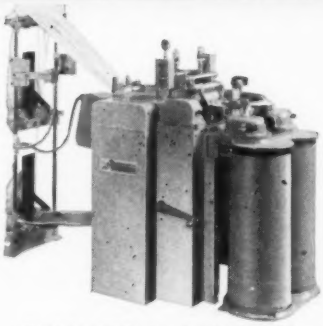
PACIFIC® CONVERTER—In one operation converts tow to cut staple ready for drafting; blends synthetics with natural, or different types of synthetics. Cuts staple lengths 3", 3½", 4½" or 6" in either a straight or variable staple diagram at 100 to 130 lbs./hr.

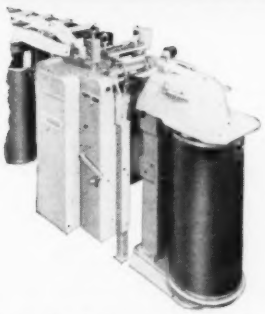
For further information use Handy Return Card, Page 149

LINE OF PIN DRAFTER®
-MOST COMPLETE IN THE WORLD!

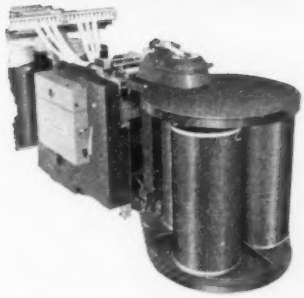
FALLER BARS*



Dual Can Delivery—Available with 15" x 36" and 15" x 42" cans.

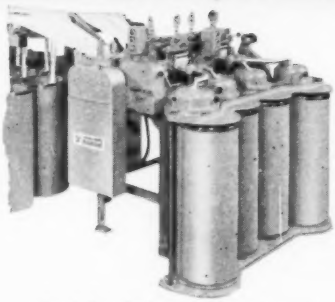


Single Can Delivery—Available with 18", 20" and 24" cans up to 48" high.



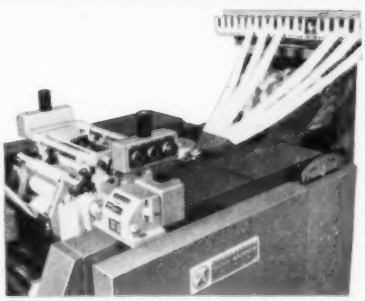
Automatic Can Doffer—Available with 18" or 20" cans up to 48" high. *Shown with Servo-Drafter.*

BARS*



Quad Can Delivery—Available with 15" x 36" and 15" x 42" cans.

SERVO-DRAFTER



SERVO-DRAFTER—New single head Servo-Drafter operates at mean speed of 1500 DPM . . . controls weight within 1% . . . corrects infeed variations of 25% in wools, synthetics, blends. Manual or automatic delivery.

Whatever your drawing needs may be . . . French, Bradford, American or Jute Systems, card room, comb room, dye house or blending operations . . . there is a Warner & Swasey Pin Drafter to meet them *profitably*. These machines are a product of the concept that you can do it better, faster, for less . . . with a Warner & Swasey—a concept that's being proved in mills all over the world today.

Built to Warner & Swasey's exacting machine tool standards, this equipment utilizes extensive interchangeability of parts and cuts maintenance operating costs to the bone. If you are looking for ways to improve quality and increase profits, you will be wise to standardize on Warner & Swasey.

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Orders are being taken now by Saco-Lowell Shops for fall delivery of Rovematic Roving Frames. An entirely new concept that breaks with the past, Rovematic delivers a 14" x 7" package of superior roving with a flyer speed of 1,200 R.P.M. maximum and a front roll ($1\frac{1}{8}$") speed of 350 R.P.M. maximum.

Rovematic is specifically designed to set new industry standards. On the basis of actual mill experience, the production of 8 Rovematic frames has been equal to 13 conventional frames. Rovematic makes obsolete the heavy traversing carriage, cones, and all related mechanisms.

Built for Better Performance. Utilizing the FS-2 drafting system with Tru-Set weighting, Rovematic is easy to operate. Its unique telescoping spindle permits quick doffing without removal of the dynamically balanced flyers. Because its major components are enclosed in sealed cases and run in oil baths, with all change gears grouped together, Rovematic is the cleanest and the easiest-to-operate frame available.

Backed by Better Service. Behind the Rovematic, as behind all Saco-Lowell textile machines, lies a two-fold purpose: to give you the equipment and assistance you need when you need it... and to add to your profits through lower cost. Call in our nearest Sales Engineer today.

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TEXTILE MACHINERY DIVISION

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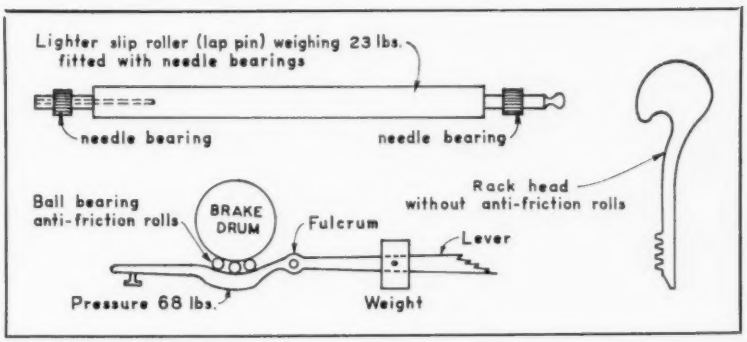
SALES OFFICES: ATLANTA, GA.—805 PEACHTREE ST., N.E.
GREENVILLE, S.C.—P.O. Box 1698; CHARLOTTE, N.C.—P.O. Box 149;
GREENSBORO, N.C.—601 N. Elm St. Bldg.; SACO, MAINE—P.O. Box 230

HOW OTHERS MANAGE

Up-front picker changes lick lap-licking

THE EDITORS:

This kink results from extended mill tests to find a way to make fine-denier nylon laps that will not split. We have accomplished this by using a lighter lap pin (slip roller) than normally, fitting it with needle bearings, and using ball bearing rolls in place of the brake shoe most often used to apply pressure to the rack heads. We use a plain rack head, one without the antifriction rolls.



Our fiber would not stand a great amount of opening without forming neps, so when we reduced the beating to hold back the neps, we suffered much lap splitting at the cards. Adjusting our air currents at the screens and installing split lap preventer fingers on the pickers helped, but we still had the problem in some degree.

But when we replaced the existing 33-pound lap pin with one weighing 23 pounds and completed the other changes, our laps would unroll without splitting (licking).

The antifriction rolls contact the brake drum at a pressure of 68 pounds and permit lap build-up to raise the racks in a much smoother action than we formerly enjoyed.

CONTRIBUTOR NO. 1324

Win $100 — Send your kinks now! — Win $100

Every kink, short-cut, time-saver, or quality improvement suggestion entered in the contest will be paid for at current space rates immediately upon acceptance, and the $100 award will be made to the winner as soon as all entries are judged.

The contest rules are simple:

► All contributions must be postmarked not later than midnight, August 15, 1961.

► No limit to the number of entries an individual may submit in any one contest.

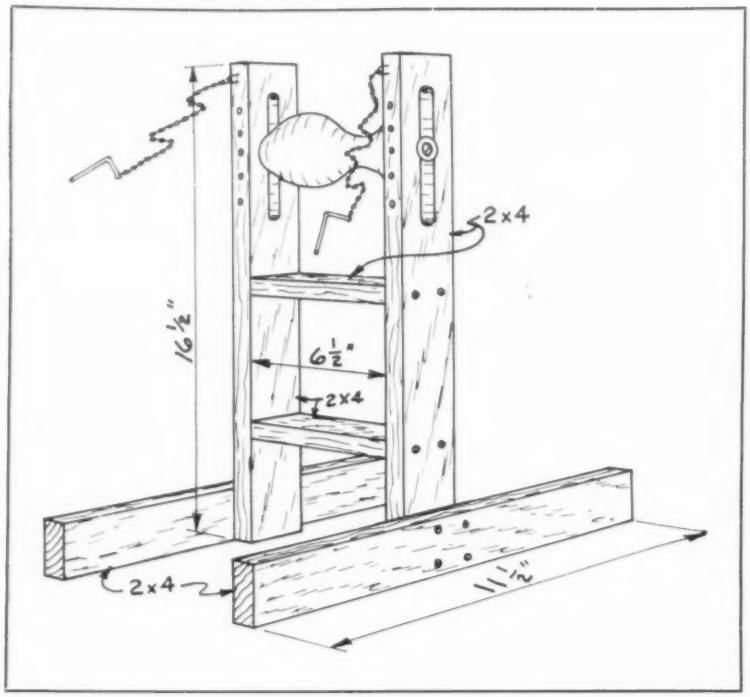
It's Later Than You Think

This contest period ends in a few weeks, August 15 to be exact, so get your entries in now. The winner gets $100.

► All entries paid for upon acceptance — no waiting. Extra payment for photographs that are usable. Extra consideration is also given kinks accompanied by legible pencil sketches or drawings.

► Entries must not have been published previously and must not be submitted to any other publication.

► Send your contest entry to: The Editors, TEXTILE INDUSTRIES, 1760 Peachtree Rd., N.W., Atlanta 9, Ga.



Stands help minimize spinning roll run-out

THE EDITORS:

We use the adjustable stand shown here to keep our steel rolls aligned as we assemble them. Thus any unevenness in the floor is not transmitted to the rolls to cause run-out troubles. We find five stands adequate.

While the stands may be built to fit any local condition, I am including our dimensions for whatever convenience they may offer. The framing is of 2" x 4" wood.

The adjustable cross-member on which the rolls rest is shaped from a wooden block. A single long rod may be passed through it to serve as axis, or short studs inserted. Whatever the means, supply washers to keep the rod confined to the upright slots, which we cut five inches long.

This adjustable roll is supported by pins inserted under the axles. The pin holes are one inch apart, and the pins are bent from short sections of rod. We secure ours to chains which in turn we staple to the frames to keep them handy.

CONTRIBUTOR No. 1322

Air washer screen cleaning cut 50 per cent

THE EDITORS:

One prominent southern mill formerly cleaned air washers in the air conditioning and refrigeration system once a week and sometimes twice a week. The cleaning procedure was time-consuming and a nuisance, as well as costly in terms of labor for maintenance.

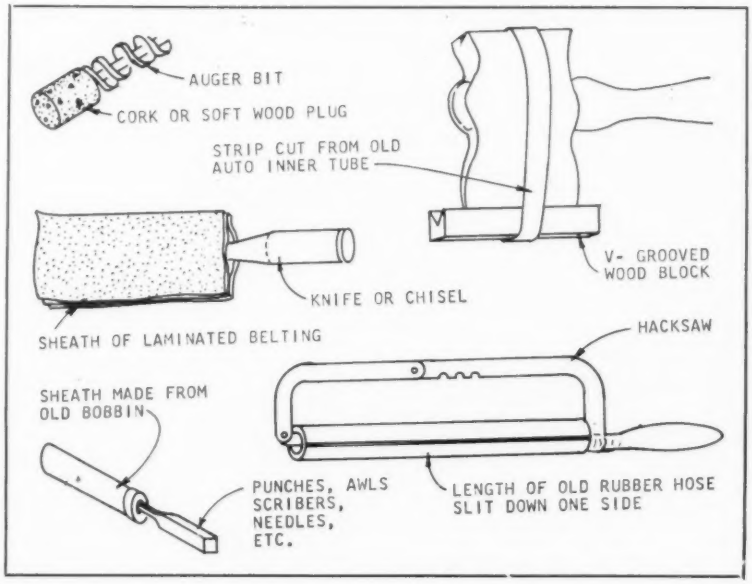
The installation of a screen on the air washer served to collect lint and foreign substances, thereby reducing the amount of maintenance and cleaning necessary by 50 per cent.

The simple screen (see accompanying photo) is inexpensive and is not designed to replace or obviate the need for other desirable and more thorough and extensive filtering media needed in other locations in the mill.

New and faster machinery in this mill, along with shorter staple cotton in current popular channels of trade have brought on more cleaning problems throughout the

plant. The simple screen was easily and quickly installed, thereby solving a maintenance problem economically and satisfactorily, according to engineers on the job. Cost installed was about 2 cents per cfm for each 85,000 cfm capacity.

CONTRIBUTOR No. 1325


AUGER BIT
CORK OR SOFT WOOD PLUG
STRIP CUT FROM OLD AUTO INNER TUBE
V- GROOVED WOOD BLOCK
KNIFE OR CHISEL
SHEATH OF LAMINATED BELTING
HACKSAW
SHEATH MADE FROM OLD BOBBIN
PUNCHES, AWLS SCRIBERS, NEEDLES, ETC.
LENGTH OF OLD RUBBER HOSE SLIT DOWN ONE SIDE

No nicked edges, no wounds

THE EDITORS:

The illustrations show several means of protecting various edged tools against damage in storage or in transit. Even better, though, is the protection they offer the craftsman.

CONTRIBUTOR NO. 1300

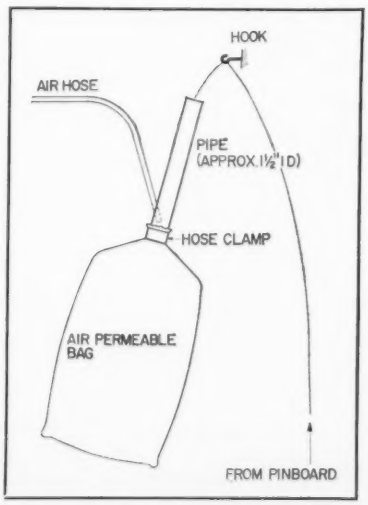
Makes dirty filling disposal a breeze

THE EDITORS:

Growing tired of the waste, mess, and the blood from knife cuts associated with disposing of waste from dirty filling yarns, pieces, etc.? Finding the waste reel inefficient, I made a suction device from six feet of air hose, a 14" piece of cardboard cloth tube, and a quantity of friction tape.

The tube has an inside diameter of 1½", so any piece of pipe or tubing approaching that diameter will work as well. About three inches from the end of the tube I cut a hole through the tube wall, beveled the end of the air hose for about 1½" and stuck it into the hole in the tube. I taped the assembly together, secured it to a post (sticking the long end of the cloth tube upward), tied a sack around the bottom end, plugged the air hose into an air line, and let the suction pull the yarn off the quills.

To speed the operation, I placed the waste packages on a pinboard and ran the filling ends over a wire hook positioned four or five feet above the suction device.



The "kink" pulls off bad filling, puts it in a bag, keeps waste off the floor, improves housekeeping, eliminates gashed hands, can be operated by anyone, and is out of the way.

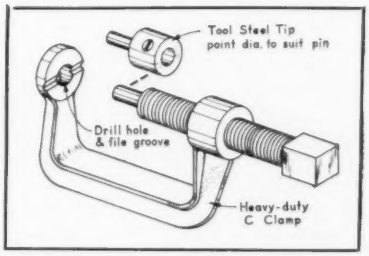
CONTRIBUTOR NO. 1320

Portable pin remover

THE EDITORS:

This is a portable press for removing small pins without damaging either them or the part that holds them. It is better than hammer and punch for most uses.

I made it from a heavy-duty C clamp that I adapted to the purpose by dismantling the screw, chucking it in a lathe, and turning a cylindrical tip on it where the pad formerly worked. I made an assortment of interchangeable tool-steel tips to fit over that portion. See the illustration.



Then I drilled a hole through the anvil portion of the clamp, lowered the tip against the anvil, and marked it for a groove which I carefully filed across it. The groove positions the clamp on round stock, keeps it from slipping as the screw is turned.

CONTRIBUTOR NO. 1323

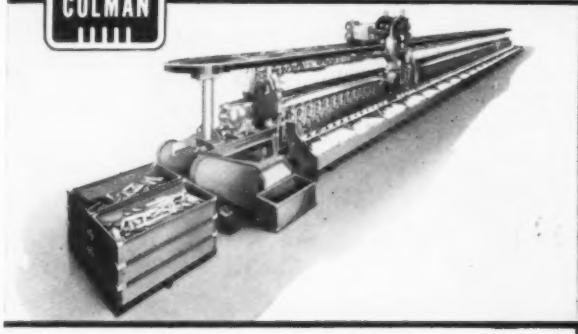
Cuts knitting needle breakage

THE EDITORS:

We use a bentonite-base grease which does not break down under high temperature developed in the

BARBER COLMAN

MACHINES FOR MODERN MILLS

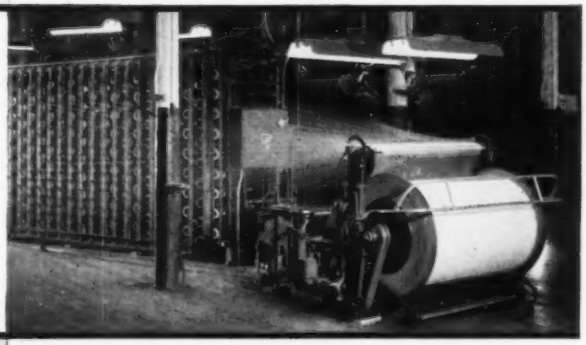


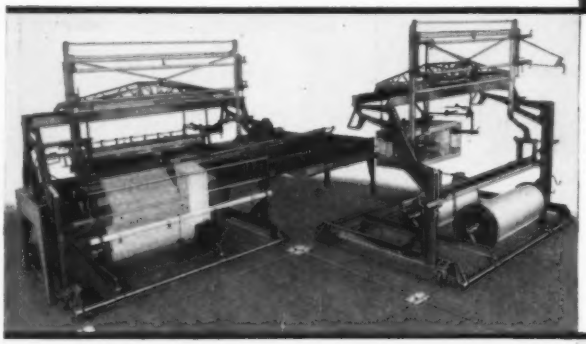
NEW TYPE "F" AUTOMATIC SPOOLER

Increased capacity in the new Type "F" Spooler permits spooling of cheeses and cones up to 6½ lbs. weight from bobbins up to 12¼" long. New features include redesigned bobbin pockets, skewers, winding drums, cheese arms, and snick plates — and the addition of a tailings sorter, tape breaker, and other optional mechanisms. As always, "Every Knot is a Weaver's Knot."

LARGE-PACKAGE SUPER-SPEED WARPER

The companion machine to the Type "F" Spooler is an improved Super-Speed Warper and Creel. The creel is arranged to take the large 6½ lb. cheeses, the warper will wind larger beams than previous models. In addition, automatic power mechanisms built into the warper enable the doffer to handle the beam from warper to floor or truck with minimum effort.



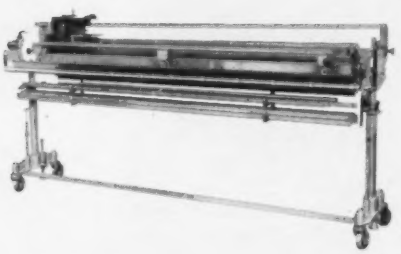


VERSATILE WARP-DRAWING MACHINES

Improved models of the familiar Barber-Colman Warp Drawing Machine now handle an even greater variety of warps, drawing them accurately from flat sheet, one-and-one lease, or double beams. The pattern-controlled mechanism automatically selects the correct thread eyes for each end, in loom combinations of as many as 26 harness, 6 banks of drop wires, and a reed.

PORTABLE WARP-TYING MACHINES

A variety of types and sizes are available to suit all conditions. They will accurately and rapidly tie-in warps of cotton, wool, linen, worsted, mohair, silk, or synthetics. All models operate up to 325 knots a minute, controlled by variable-speed motor drive. Larger stationary models can be furnished where required.



AUTOMATIC SPOOLERS • SUPER-SPEED WARPERS • WARP TYING MACHINES • WARP DRAWING MACHINES

BARBER-COLMAN COMPANY

ROCKFORD • ILLINOIS • U. S. A.

FRAMINGHAM, MASS., U. S. A. GREENVILLE, S. C., U.S.A. MANCHESTER, ENGLAND MUNICH, GERMANY

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For further information use Handy Return Card, Page 149

knitting machine cylinder. This grease is applied by small brush to the pattern jacks below the needle level and does away with much pattern failure. It also acts as a constant cushion to the needles. No discoloration results in the fabric.

The machines tested with this special lubricant were 400-needle Bentleys, Model KL, 3¾" diameter cylinder, spiral type. Application of the lubricant is made with a paint brush 1" wide.

Machines operate at 185 rpm. The lubricant formerly used did not withstand the temperature developed in the machines and ran off like thin oil.

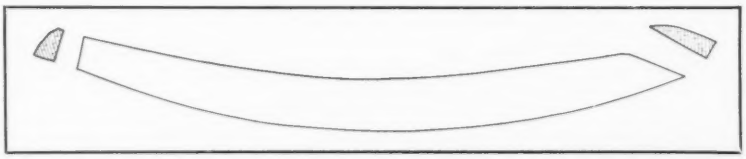
Only slight amounts need be used. The results, in operation of the machine, are that pattern jacks in the lower half of the cylinder are always supported by the newly found lubricant. Our tests proved that needle breakage was greatly reduced and faulty mesh fabric eliminated nearly altogether. We use grade No. 00.

CONTRIBUTOR No. 1288

The present kink contest ends midnight August 15

Rules on page **127**

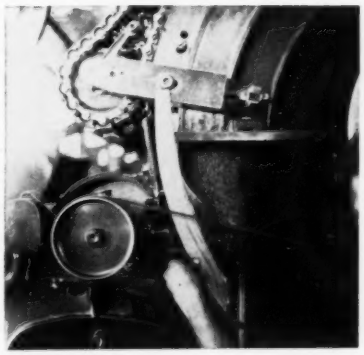
Wooden seal stops card snowballing



THE EDITORS:

Our H & B cards had resisted our every effort to stop their snowballing. We tried to cover the gap between the cylinder undercasing and the side frame, but the fly still managed to blow out the cylinder ends. This kink proved the answer.

We curved a wooden block, about an inch thick, in the form suggested by the illustration and secured it to the inside of the card frame, between the side framing and cylinder at the licker-in sides —see photograph. We shaped the block to conform neatly to the cylinder shell curvature and secured it in place with screws.

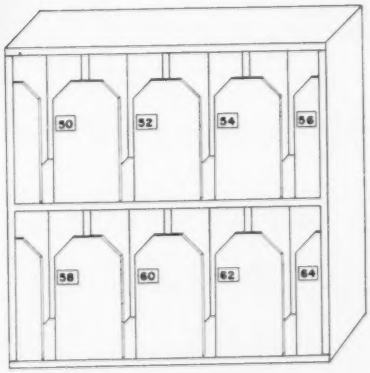


CONTRIBUTOR No. 1321

Bin keeps pick wheels in order

THE EDITORS:

Storage bins that will keep pick wheels separate, out of the way, and yet easily accessible can be made of 1" x 12" boards. Each compartment is approximately one foot wide, one foot long, and two feet high.



The pick wheels are stacked flat in the bins and, when one is needed, it is slipped upward to the top of the face boards and lifted out.

CONTRIBUTOR No. 1312

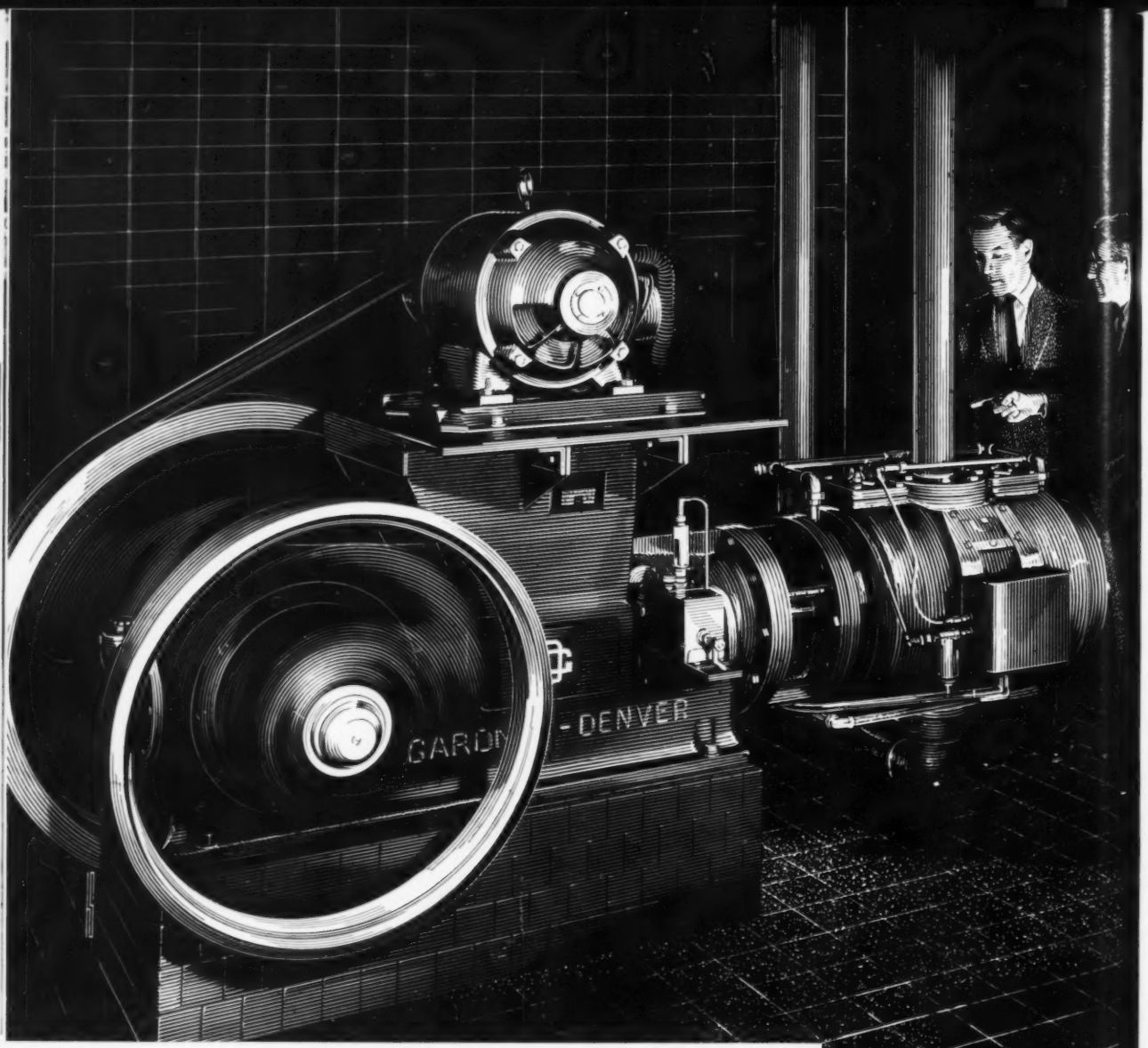
Checks warp stop motion performance

THE EDITORS:

A drop wire taped to a wire handle can be used to check the effectiveness of the mechanical warp stop motion. Standing in front of the loom at the shipper, extend the wire handle across the loom and insert the drop wire between teeth of the feeler bars.

Check the stop motion with the sliding feeler bar moving from left to right and from right to left. If the stop motion is effective, the loom should stop on the first pick with the harnesses level.

CONTRIBUTOR No. 1314



"No more oil to spoil our quality"

. . . the reaction to Gardner-Denver oil-free compressors. They protect product quality by delivering pure, clean air—air that never has a drop of oil in it. So if even a trace of oil in your air line is too much, see Gardner-Denver first. Write for bulletin CRC-10.

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GARDNER-DENVER Since 1859

EQUIPMENT TODAY FOR THE CHALLENGE OF TOMORROW

GARDNER - DENVER

Answers to "How are woolen blends calculated?"

In the January, 1961, issue CONTRIBUTOR No. *1274 said, ". . . we have the following blend:*

"Sliver A—210 grains/yd, composed of 30% blue rayon and 70 white wool;

"Sliver B—172 grains/yd, 30% green rayon and 70% white wool;

"Sliver C—416 grains/yd, 100% mohair; and

"Sliver D—245 grains/yd composed of 100% wool. From these we wish to make a blend of one per cent blue (blue only, without the wool), one-half of one per cent green (green only, without the wool), 29½ per cent mohair, and 69 per cent wool.

"What necessary regilling is needed for the least number of operations so that when it is fed through the first dual head intersecting draw frame the blend is correct?"

Two veterans of the wool industry sent the two methods reproduced below.

THE EDITORS

THE EDITORS:

Here is a step-by-step procedure for blending the stock mentioned by CONTRIBUTOR No. 1274:

	Blue rayon	White wool	Mohair	Green rayon	Total
A	63	147	—	—	210
B	—	120	—	52	172
C	—	—	416	—	416
D	—	245	—	—	245
	63	512	416	52	1043
Desired Blend, %	1%	69%	29.5%	0.5%	
Desired Blend, Gr.*	63	4347	1858.5	31.5	
1st Operation Blend A B D			Draft 7.5		
5 A	315	735	—	—	
3 B	—	360	—	156	
9 D	—	2205	—	—	
Total	315	3300	—	156	
Resultant Blend in Gr.	42	440	—	21	

2nd Operation Blend	Blue rayon	White wool	Mohair	Green rayon
1 end from 1st blend A B D	42	440	—	21
10 ends "D" White Wool	—	2450	—	—
3 ends "C" Mohair	—	—	1248	—
Total	42	2890	1248	21
End Resultant Blend %	1%	68.8%	29.7%	0.5%

*63 grains x 69% = 4347 grains. 63 grains x 29.5% = 1858.5, etc.

CONTRIBUTOR No. 1307

THE EDITORS:

The blend below is not exact but it will be very close. There is a little extra wool and mohair in the blend. We find we make more waste and have more dead loss from them than from the rayon.

I arrived at this blend by finding the least number of ends which would give me a 2 to 1 ratio of the blue and green. The 5 ends of blue gave me 315 grains of blue rayon. This I multiplied by 100 to get total weight of blend. I multiplied the 31500 gr. blend by per cent of each fiber needed in finish blend to find how much of each to put in. The blend can be made in two processes if equipment is available to run 14 and 15 ends.

CONTRIBUTOR 1304

10 WOOL	10 W	10W	11W	11W	11W	11W	11W
3 MOHAIR	3M	3M	3M	3M	3M	3M	2M
1 GREEN	1G	1G	1BLUE	1B	1B	1B	1B
↓	↓	↓	↓	↓	↓	↓	↓
1	2	3	4	5	6	7	8

8 ENDS MAKE FINISH BLEND

Follow the cleaning arrow

THE EDITORS:

A numbered clearer board stenciled with the job number marks the spot at which cleaning

stopped when work is interrupted by shift change or other reason. The spinner moves it along the rolls in the direction of the arrow.

CONTRIBUTOR No. 1299

Best opening line position?

THE EDITORS:

I should like reader comments concerning the best place for a Superior Cleaner to be placed in the opening room line-up when the plant is processing Strict Low Middling cotton. Our opening line has, in tandem, the following:

4 vertical feeders (F7)

1 vertical opener

1 lattice opener No. 12 with 11A condenser

1 lattice opener No. 12 with 11A condenser

1 Superior Cleaner

DIEGO TORRENTS T
(Colombia)

He's using a tougher yarn...why aren't you?

It takes a tough yarn to tote a missile weighing thousands of pounds...and tough is the word for high-tenacity Golden Caprolan® nylon by Allied Chemical.

But Golden Caprolan is more than just tough. It is a remarkably versatile yarn that offers a unique combination of superior performance qualities. Unsurpassed resistance to abrasion, excellent rubber adhesion, greater resistance to flex-fatigue, excellent troughing qualities, to name a few. Golden Caprolan established a new criterion for heat stability in nylon tire cord and a new standard of strength for marine cordage.

Golden Caprolan is also performing superbly in conveyor belts, tarpaulin fabrics and dozens of other applications where heavy-duty performance is essential. If you have a tough job, we have the tough yarn for it. Our technical service staffs are always ready to help you.

Allied Chemical Fiber Marketing Dept., 261 Madison Ave., New York 16, N.Y.

GOLDEN caprolan NYLON FOR THE 60's

For further information use Handy Return Card, Page 149

Narrowing defects

(from page 123)

Turn the machine by hand until the points are against the needles, and by pulling the needle bar in and out, see if the needles fit the grooves in the narrowing points properly. If the needles move either to the right or the left, the needles are not properly pliered or the needle bar is not properly centered. The narrowing finger should always be centered with the sinkers and dividers and never set to the needles.

Should this particular head continue to give trouble, check needle bar height, and be sure it is level. Check the knock-over height, and be sure it is centered.

Trouble at All Heads. In the event there is an excessive amount of narrowing trouble involving the entire machine or one end of the machine, there are several steps to take.

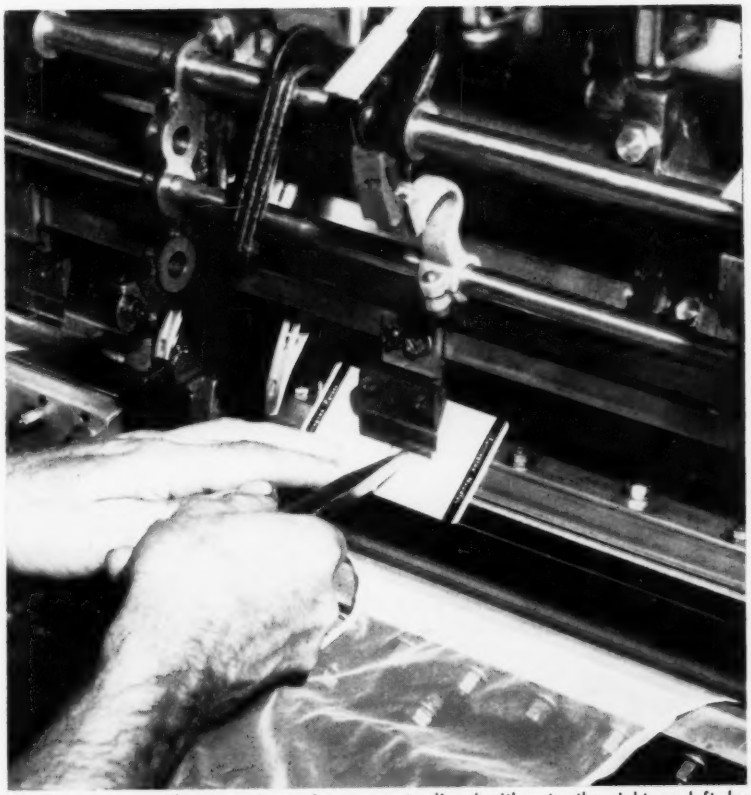
Check the narrowing mechanism to be sure it is in proper alignment and set at the proper height.

With the narrowing points entering the sinkers and dividers, have someone shake the nuts on the narrowing spindle while you watch the points with a magnifying glass. If the points move, there is lost motion either in the narrowing nuts or the narrowing spindle. This can usually be eliminated by tightening the nuts on the spindle. Do not tighten them too much, however, or the narrowing will bind. See that there is no end play in the spindle.

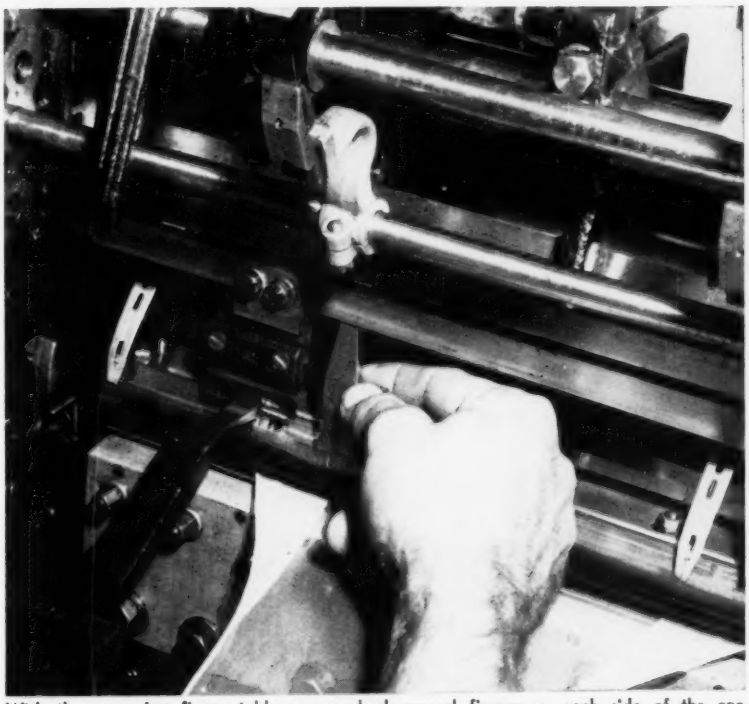
Check and be sure that the narrowing is not being racked too much or too little during the narrowing motion. This can be checked by watching the narrowing dial and plunger.

Knitter Is Key Man. Narrowing defects should be found as early as possible so they can be eliminated before the machine runs for several shifts or even days in this condition.

With one knitter operating two machines instead of one, it is difficult for him to inspect all narrowings on each set run. This not



Check to be sure the narrowing points are not pliered either to the right or left by placing a needle card behind the finger.



With the narrowing finger table gauge check several fingers on each side of the one giving trouble to be sure the narrowing mechanism itself is in proper alignment. Next check the troublesome finger itself, using the same gauge.

only works a hardship on the operator, but it cuts production also. The knitting machine operator should be required to inspect all narrowings on one set on each machine at the beginning of his shift and again about the middle of the shift. This provides an inspection on the machine every four hours.

Test Sets. It is a good idea to have at least two sets of stockings from each machine per shift numbered with crayon. This will help in determining which head made a defect found during inspection. It also helps to have the third shift operator turn in a test set each night. These test sets should be clearly numbered, seamed, and inspected each day if possible.

Should an inspector find several stockings with the same defect, she should be instructed and trained to bring it to the attention of her supervisor so that he may notify the proper person in the knitting department.

Use of these procedures will help to control quality, increase production, and lower costs in the full-fashioned knitting mill.

Technical developments

(from page 25)

rics, and the number of neps in cotton samples, have been announced by American Standards Association. The tests were developed and published by American Society for Testing Materials.

FABRICS AND PRODUCTS

Fusible Interfacing Fabric. A New Jersey firm is now in production of a fusible fabric for garment interfacing which was developed in England. The material is reputed to be completely washable or drycleanable.

Machine-Washable Nonwoven Draperies. Soon to be marketed by Lustron Draperies, Inc., of New York are machine-washable draperies of nonwoven fabrics. The fabrics are all-rayon and a recently developed chemical binder is said to be responsible for this break-through in nonwovens which takes the draperies out of their former "disposable" category. The draperies will be available in eight patterns in ten sun-resistant colors. The materials are flame-retardant and require only touching up with a warm iron after laundering.

Cross-linking

(from page 113)

from the many, well established shortcomings of conventional treatments.

Sulfone materials when properly applied display the following characteristics:

Efficient wash/wear performance.

Complete freedom from chlorine damage or chlorine retention,

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THE DARY RING TRAVELER CO.
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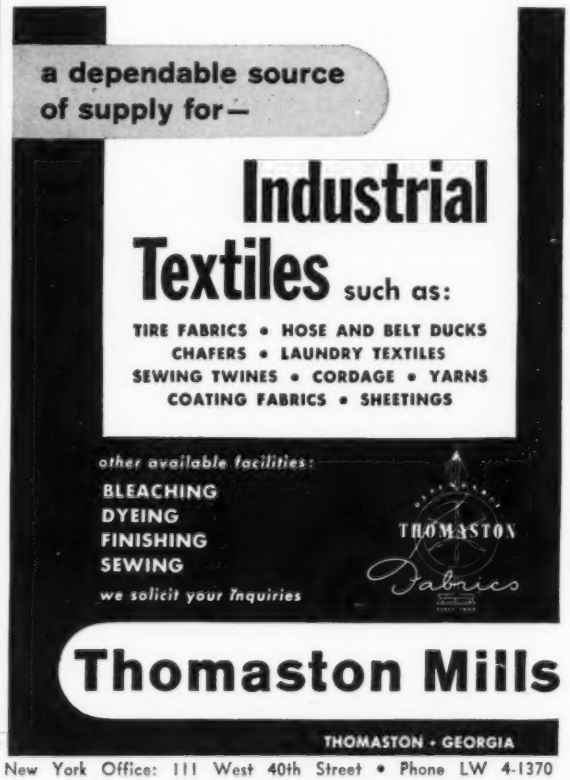


New York Office: 111 West 40th Street • Phone LW 4-1370

For further information use Handy Return Card, Page 149

regardless of the wash procedure used.

Outstanding durability — again regardless of the wash procedures used.

No odor immediately following processing or after extensive storage.

Excellent resistance to heat discoloration—equal to that of the untreated fabric.

The sulfone-base chemicals are like the epi and glycerol dichlorohydrin reagents in that they are applied in an alkaline system on conventional equipment. To date, one of the major problems incurred when using sulfone-base materials for chemically cross-linking cellulose lies in the fact that the fabric after curing does possess a very much off-white or even yellow cast. Therefore, it is necessary in the vast majority of cases to open-width bleach the fabric in order to remove this discoloration and render the fabric white again.

Here again in the field of wet cross-linking, we may find a similar pattern to that which has been pursued by the thermosetting resin manufacturers and users: the use of one of these cross-linkers for producing wet crease resistance together with (either before, simultaneous with, or after) another chemical, possibly yet even unannounced.

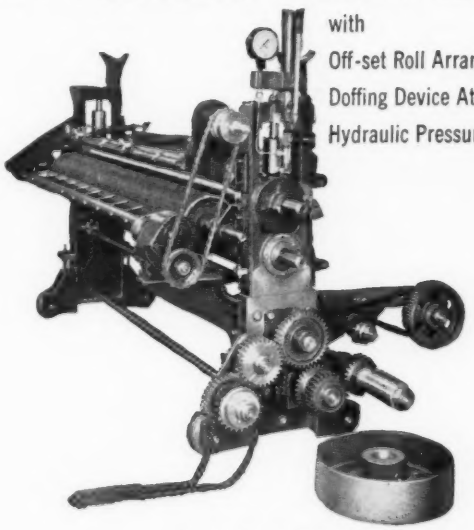
Rather recently we have been reading a great deal about Courtaulds "Prestwick" finish and also the Bancroft Co.'s "Bancare" finish. Here again we are talking about products and processes that are reputed to produce excellent wet and dry crease resistant effects. Based upon trade rumors, I think it an accurate guess that the chemical involved is formaldehyde that is being used to cross-link the cellulose and produce the claimed performance characteristics.

Prestwick. During the past year and a half, millions of yards of fabric finished with Prestwick (both cotton and rayon) have been processed and successfully evaluated by countless consumers throughout the nation. This particular process does not involve a resin, but rather a very simple and inexpensive chemical, formaldehyde, that has been known to be a cross-linker with cellulose for many years. However, it is believed that the buffered catalyst used in this process is one of the prime reasons for its success and commercial control ability.

It is claimed that this process does indeed have a very high efficiency in imparting dimensional stability to the fabric as well as good wet and dry crease memory. This process, like so many others using resin and cross-linking chemicals, does cause tensile and tear strength losses.

Bancare. It is stated that this process is non-resinous, and the chemicals are readily available. This would give credence to the guess that the material used for cross-linking is formaldehyde. The assets of this type finish are said to be good wet and dry crease recovery, good shrinkage stabilization, good durability, and no chlorine retention.

NEW "LIGHTWEIGHT" PERALTA® MACHINE



with
Off-set Roll Arrangement
Doffing Device Attachment
Hydraulic Pressure

Write for information.

Duesberg-Bosson of America, Inc.
Main Street Jefferson, Mass. P.O. Box 25

BE SURE YOU SPECIFY—
ON YOUR NEW FRAMES PNEUMAFIL®

Only PNEUMAFIL gives you exclusive "air flow" suction to "swallow" more air, capture more lint, enable faster front roll speeds. Special ring diffusor fan gives widest range of operation at peak efficiency. Choice of three discharge arrangements.

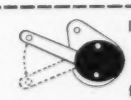
plus

DELTAFLUTE

A powerful new "lap fighter." Unique shape allows closer flute positioning under front roll. Shorter, wider orifice concentrates air stream at point of maximum lint generation for remarkably good cleaning.

plus

DUFLEX SUSPENSION



Instant and effortless two-position suspension of flutes permits operator to work around rolls with both hands. Eliminates danger of scratched orifices which cause lint accumulation.

PNEUMAFIL CORPORATION • CHARLOTTE 8, N. C.

NEW PRODUCT PARADE

Please note: Claims made in all of these announcements of new developments are of necessity based upon information furnished by the respective suppliers.—The Editors.

Demonstration model of the Foster Model 506 winder on display at the recent Knitting Arts Exhibition.

Improved sales yarn winding at lower cost

The Foster Model 506 winder for sales yarns produces packages of higher quality and provides on the average a 50% increase in operator productivity as compared with conventional manual winding machines. A foolproof full-package stop motion, electronic tension, improved slub-catcher, redesigned yoke, and aluminum ball-bearing cone holder are some of the construction features of the machine, the standard 144-spindle model of which operates at a speed of 900 ypm on all counts. Knots are tied by the operator with a high speed tying instrument; in ten hundreths of a minute, using a minimum of motion, she can start a winding head.

The full-package stop motion performs by emitting a signal at the exact time the yarn package has reached a predetermined diameter. At that time a knife edge is engaged that automatically interrupts passage of yarn from bobbin to cone. At same time, a signal light is flashed on the individual spindle, signifying to the operator that the package is full and ready to be doffed.

Foster Machine Co., Westfield, Mass.

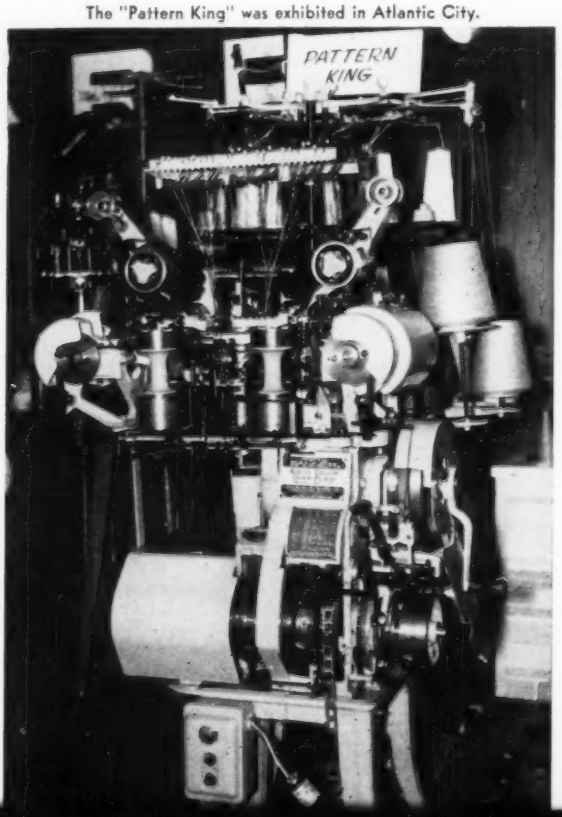
Do you want more data? Write ◂ or use card on page 149; list 6-101

Half hose knitter offers patterns galore

A new addition to the Hemphill Banner line of half hose knitting machines, the "Pattern King," offers new and greater pattern scope. Designed to knit patterned parts of hosiery of practically any desired size, shape, and variety of colors with definite, clear edges, the machine knits automatically up to 16 colors to a course, using any kind of yarn. Virtually uninterrupted production is assured by a new Banner yarn stop motion which also contributes to greater mill savings.

Some construction features: knits with or without heel and toe reinforcement; 48 index moves; picks are placed for easy and troublefree operation; carrier ring is positively adjustable for concentricity to needle circle and correct height to feed all yarns at proper angle and protect needle latches at all needle levels. Yarn change disc

The "Pattern King" was exhibited in Atlantic City.

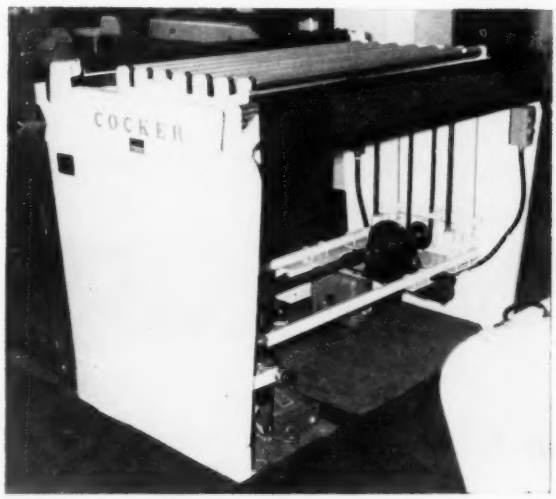


drive is gear and universal joint type; number of take-ups is greater to take advantage of selectivity of yarn lever control tapes.

Wildman Jacquard Co., 1210 Stanbridge St., Norristown, Pa.

Do you want more data? Write ◂ or use card on page 149; list G-102

How to quickly find broken ends at the warper



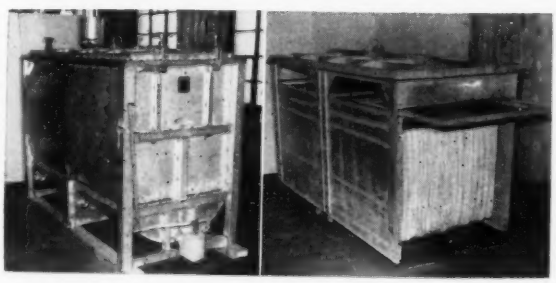
A new aid to high-speed warping is the Cocker Yarn Accumulator which makes it possible for the warper tender to easily unwind yarn from the warp beam when an end breaks and quickly locate the broken end. With this machine, lost ends are prevented and quality is thus improved.

Direction of travel of warp yarns is reversed simply by operating the pushbutton control on the machine which is equipped with 14 rolls for the yarn to pass over. Accommodating a 42-foot section of the yarn sheet, the accumulator rolls can be expanded to separate the sheet and speed location of lost ends.

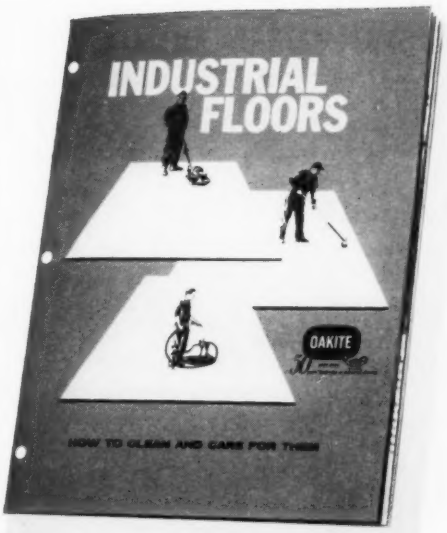
Cocker Machine & Foundry Co., Box 431, Gastonia, N. C.

Do you want more data? Write ◂ or use card on page 149; list G-103

Efficiently dyes high-bulk Orlon and other yarns



The KWG Duo-Flo Skein Dyeing Machine was developed especially for dyeing yarns of high bulk Orlon and other fibers where controlled shrinkage is an important factor. However, the 200-lb capacity unit may



Take a GOOD look at this Oakite Booklet!

It tells how to keep floors cleaner . . . safer

YOURS FOR THE ASKING is this 10-page booklet. Take a good look at it! It describes latest methods and materials for safe, efficient maintenance of twelve different types of factory and office flooring. Included: wood, linoleum, cement, cork, marble, metal. Suggested procedures assure minimum floor wear, maximum safety.

Booklet also discusses modern mechanized methods of keeping floors clean and sanitary. Tells of the remarkable saving that can be made in maintenance hours, effort and expense.

Ask your Oakite man about good floor care for your plant. Meanwhile write today for a copy of *Industrial Floors: How to clean and care for them.* Oakite Products, Inc., 26C Rector Street, New York 6, N. Y.

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NEW! AUTOMATIC SELF CLEANING

LINT-A-MAZE ARRESTOR

Cleans the air of...

* **LINT**
* **CHAFF**
* **FIBROUS MATERIAL**

AIR-MAZE LINT-A-MAZE FILTERS are specially designed to provide 98% or more efficiency in removing heavy concentrations of lint, chaff, leather cuttings and similar materials from the air. Brushes mounted on a chain carrier continually sweep and automatically clean the collector screens. Collected material is deposited in a hopper for reprocessing or sale. Lint-A-Maze filters offer these important advantages:

- Low initial cost . . . low operating cost
- Require less than 50% of the space normally needed
- Virtually eliminate maintenance – no rolls or blankets to replace, no washing or cleaning
- Handle wet or dry impurities
- Can be installed in any recirculating air opening, ventilating or air-conditioning system
- Available for airflow requirements from 7,000 to 150,000 CFM, can handle air velocities from 250 to 1900 FPM.

FREE! For additional information write for Bulletin No. 150.

AIR-MAZE DIVISION
CLEVELAND 28, OHIO
ROCKWELL-STANDARD CORPORATION

be used for dyeing yarns of natural and other man-made fibers as well.

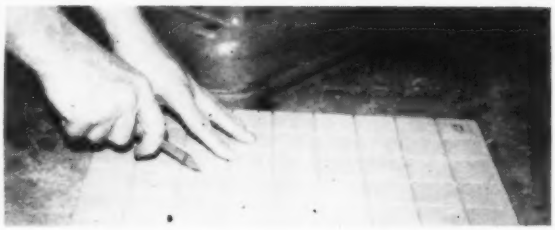
The machine features a specially machined propeller which is located in the center of the tub for efficient circulation of dye liquor through the yarn carrier which is designed to assure maximum dye penetration, uniformity of results, and ease of handling.

Dye liquor circulates at controlled rate of flow up through perforated bottom to top on one side of partitioned yarn carrier, across top and down through other side in continuous—and automatically reversed—flow cycle.

Klauder Weldon Giles Machine Co., Adams Ave. & Leiper St., Philadelphia 24, Pa.

Do you want more data? Write ◂ or use card on page 149; list G-104

Speeds machine installation, prevents vibration

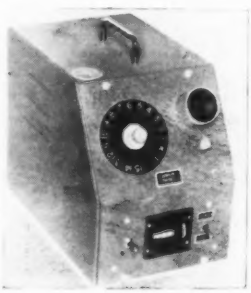


Production machinery does not vibrate or "creep" when it rests on Kinetic Isolation Pads which are made of specially processed, high density glass fibers encased in an impervious jacket of neoprene. Other benefits to be derived by using the pads, which are furnished in 18" x 18" x ½" sheets prescored at 2" intervals for easy cutting to size on the job with a pen knife, are: faster and less expensive installation and/or relocation of equipment; pads last longer as jackets are impervious to water, oil, detergents, and other liquids and they do not experience permanent set nor "felt-down" with time; elimination of chatter in precision machines caused by externally-excited vibration.

Consolidated Kinetics Corp., 1065 Dublin Rd., Columbus 12, Ohio.

Do you want more data? Write ◂ or use card on page 149; list G-105

Electronic device improves yarn inspection



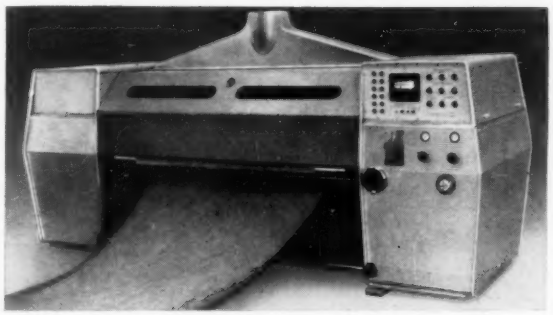
An electronic device for use with the Fabrionics warp yarn monitor virtually eliminates quality control problems in the warping operation. The device, called the Detect-All Mark II, detects and counts linear defects and end breaks and stops the warper for their removal. The system attains an unusual level of accuracy because it cuts out extraneous interferences with the signal from the photo-electric detector. A unique feature is a cathode ray oscilloscope. Detector signals are continuously monitored on the oscilloscope screen so the operator can identify and remove the sources of inter-

ference. Because of its high degree of accuracy and sensitivity, the new system permits the photo-electric yarn defect detector to be operated without a light cover. This means that yarn ends are readily accessible and re-threading broken ends becomes a simple matter.

Fabrionics Corp., Box 521, Huntington, N. Y.

Do you want more data? Write ◂ or use card on page 149; list G-106

Improved finisher for wool and high-pile fabrics

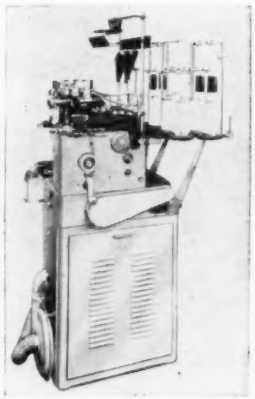


More uniform finishing of woolens, wool blends, and high pile fabrics up to 66" wide may be accomplished at speeds of 3 to 30 ypm on the new Model 3RA Electro-Finisher which features a very accurate temperature control, a built-in control station, and reversing switch that permits greater flexibility. Cradle design gives 140° surface contact of fabric with the aluminum polishing cylinder. An air cylinder control assures uniform cradle pressure.

Turbo Machine Co., Lansdale, Pa.

Do you want more data? Write ◂ or use card on page 149; list G-107

Four-feed ladies' seamless hose knitter



The new Singer-Fidelity four-feed ladies' seamless hose machine operates completely without reciprocation, making a tubular stocking with boarded heel, which is reinforced together with the foot, and a tailored toe. The stocking is produced four-feed throughout; hence, the mechanism is greatly simplified. The machine is equipped with a trimmer for the yarn changes. Special provision has been made for controlling the stocking at press-off.

A suction-type hose tensioning device, with a specially developed dynamic anti-static system which ionizes the air passing through the plastic tubes, is utilized. This completely eliminates twisting of the stocking, and facilitates automatic discharge of each stocking.

The needle selection splicing system operates on two

Around the textile mills with **SHAMROCK**

Report on how some famous products are being put to many uses. A versatile, lightweight Shamrock Truck, of course, can handle quite a few different types of jobs around a mill. One such is that shown here, to speed up movement of cones from one department to another in Calloway Mills, LaGrange, Ga.

In the manufacture of all Shamrock Trucks, Hampers and Canvas Baskets, a top-grade, extra-heavy duck is used. This results in a container of exceptional lightness, but highly resistant both to normal wear and even hard usage. Shamrock equipment, whether standard design or "made to your order" will last longer—lower overhead. For full information about the Shamrock line, and location of nearest sales office, write

MEESE INC., MADISON, INDIANA

WE DON'T MAKE ALL THE APRONS

But We Make The Best

KENTEX TEXTILE APRONS

- Custom Made
- Precision gauged
- Bark or Chrome Tanned Leather
- Absolute Uniformity

TEXTILE APRON CO., East Point, Ga.

HUGH WILLIAMS & COMPANY, TORONTO, CANADA—CANADIAN REPRESENTATIVE

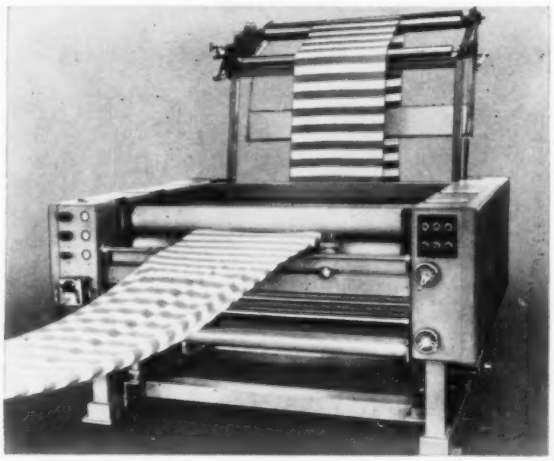
alternate feeds, producing a high quality splicing effect. This not only splices in the heel but produces a court sole which in conjunction with the tailored foot produces an attractive stocking as well as a durable one.

An optional feature of the machine is a special yarn humidification system which makes it unnecessary to humidify the whole mill to the most desirable level.

Singer-Fidelity, Inc., 3908 Frankfort Ave., Philadelphia 24, Pa.

Do you want more data? Write ◆ or use card on page 149; list G-108

Combination padder-extractor for tubular goods



A four-roll padder and extractor for tubular knit goods up to 64" wide may be used for shrinking the goods or applying sizes, resins, and other finishes. Single, double or triple ends can be processed simultaneously at speeds up to 60 ypm. Cloth can be dampened or completely immersed. A circulator pump keeps liquor in constant circulation. Rolls are pneumatically loaded, so infinitely accurate control of pressure is provided; pressures up to 2 tons can be applied.

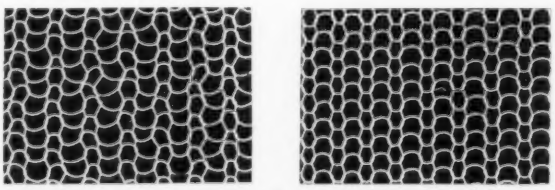
A patented spreading-feeding mechanism is used in combination with a fabric tensioning control which is attached to the press rolls. Fabric is gently stretched as it enters the infeed guides which provide side-to-side contact for more positive feed.

Turbo Machine Co., Lansdale, Pa.

Do you want more data? Write ◆ or use card on page 149; list G-109

Machine attachment improves ladies' seamless hose

Clearer fabric, less variation in over-all length, fewer streaks, softer feel, and more flexible welts are advantages of the LC/MS (length control and measured stitch) attachment which can be installed on existing seamless



Unretouched photomicrographs of stocking fabric knitted by conventional method (left) and LC/MS method (right).

hosiery machines or built into new equipment. An entirely new principle of loop construction is utilized—each loop in the knitted fabric is a "relaxed," perfectly formed extension of the preceding and following loop because the needles knit without strain. Ankles may be narrowed much more by this method than with others.

The simple equipment can be easily installed on any 400- and 474-needle seamless hosiery machine, either single or multiple feed.

Southern Mill Equipment Corp., 508-14 West 5th St., Charlotte 1, N. C.

Do you want more data? Write or use card on page 149; list G-110

Nylon cap bars for roving and spinning

Long life and no need for lubrication are advantages to be derived from graphite-impregnated nylon cap bars which are now available for Whitin, Saco-Lowell, Roberts, and H & B spinning frames and Saco-Lowell FS-2 roving frames. Static electricity is not a problem when they are used.

J. E. Cobb Co., Box 385, Gastonia, N. C.

Do you want more data? Write or use card on page 149; list G-111

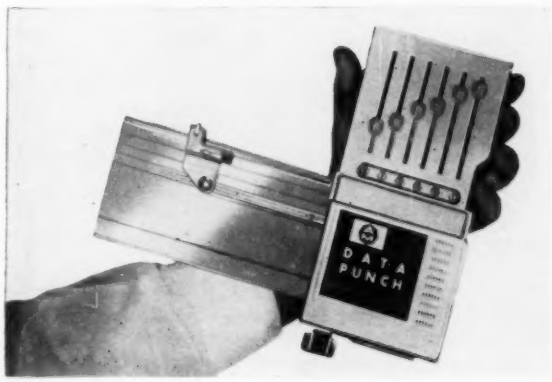
Anti-static cleaning device for plastics, glass

Especially useful for cleaning plastic or glass parts and other items which are difficult to clean because of static electricity is the Simco Anti-Static Cleaner which consists of a brush, a shockless static bar, and a suction hood. First the part is mechanically brushed to remove dust and dirt, then neutralized to prevent reattraction of dust, and finally cleaned of any remaining dirt by the suction hood. An additional suction hood on the other side of the brush can be used where it is necessary to collect the dust removed by the brush.

The Simco Co., 920 Walnut St., Lansdale, Pa.

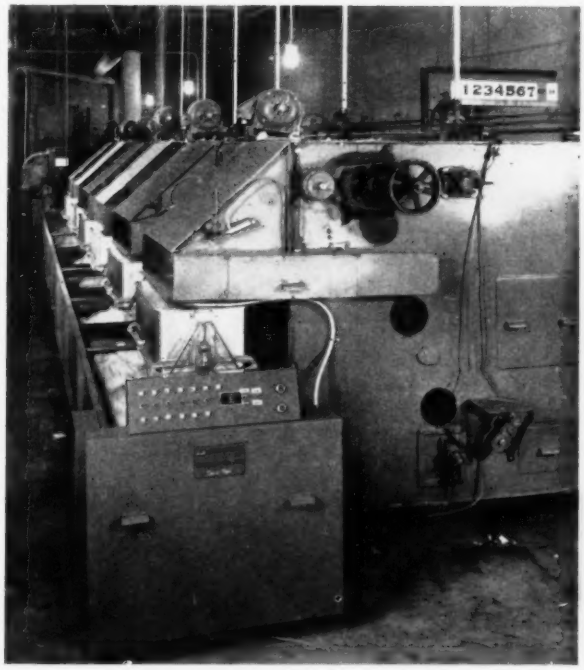
Do you want more data? Write or use card on page 149; list G-112

Punches data process cards in mill or warehouse



For use wherever source data must be gathered at locations other than the data processing site is a Tom Thumb-sized key punching machine known as the Addressograph Data Punch. Measuring only 8½" x 4¼" x 1½" and weighing only 2½ lb, the unit records data in standard punch card code directly in tabulating cards

BLEND COTTON BY DENSITY THROUGH WEIGH PANS



NOW AVAILABLE: An economical **conversion** of existing opening hoppers to weighing feeders by the addition of a scale mechanism. To be ranged with the standard sandwiching SYNCROVEYOR (control panel assembly) and plucking cylinder (The SYNCROBLENDER).

OBJECT: To improve process uniformity and efficiency throughout any Blend process by the use of this PRODUCTION INSTRUMENT.

HOW IT IS DONE: Fiber properties can vary widely. Ultimately, the basic yarn evenness requirement is to place the same number of fibers of each density (represented by the laydown) in each inch.

Therefore, consider it "fact" that stock representation per yard of picker lap is from one bale per hopper and select and laydown bales accordingly. Meter consistently predetermined increments of ounces . . of each density (fineness) designation in short term control intervals of seconds. Handle reworkable waste through 1 weigh pan.

No additional floor space, connected horsepower, or labor required for **SYNCROMATIC SYSTEM.**

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3440 Augusta Road, Greenville, S. C.

FIBER CONTROLS CORPORATION
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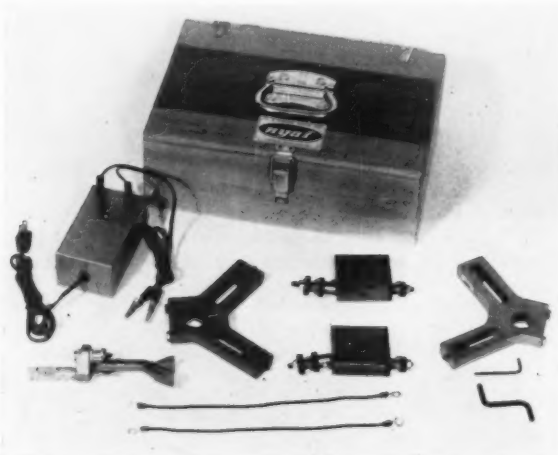
F. A. YOUNG MACHINE
MICRO-ELECTRIC PRECISION ALIGNING KIT

EASY — ACCURATE — FAST
SIMPLE — PRECISE

MODERNIZE YOUR MILL MAINTENANCE PROGRAM

NO DISMANTLING • NO UNGEARING



WILL LINE AND LEVEL ROLL-BEAM STANDS AND ROLLS TO A TOLERANCE OF .005"

Use on any type Drafting. . . .
Simply raise one saddle on each stand.
No experience necessary to operate.
About one hour to align one frame.
Have smoother turning rolls.
Cut down chatter—vibration.
Make all bearings share the load.

RUGGED IN DESIGN—SIMPLE TO OPERATE

IT'S INEXPENSIVE — for Better Maintenance . . .

WRITE US AND ASK FOR A DEMONSTRATION

F. A. YOUNG MACHINE CO.
Telephone University 5-8556 GASTONIA, NORTH CAROLINA

so that they can be fed to any data processing system without transcription or additional preparatory steps. Data to be punched and printed is entered by positioning a series of keys. What has been entered is visible for quick visual verification.

Addressograph-Multigraph Corp., Cleveland 17, Ohio.

Do you want more data? Write ◂ or use card on page 149; list G-113

Time and space-saving sample dyeing machine

Recently introduced to assist the dyer, chemist, and dyestuff manufacturer was the Gaston County Model 101 sample dyeing machine. In a stainless steel cabinet which measures only 20" wide by 26" deep by 44" high, the machine will dye 12 sample skeins, tapes, cloth swatches, or raw stock units at conventional or high temperatures. Agitation is automatic and gives very even results. The all-electric (110-volt a-c) heating is automatically controlled.

Gaston County Dyeing Machine Co., Stanley, N. C.

Do you want more data? Write ◂ or use card on page 149; list G-114

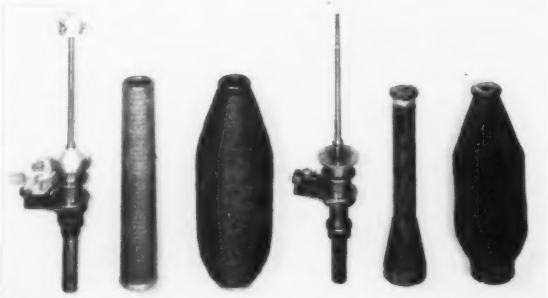
One grease for most grease-lubricated parts

Use of Quaker State Multi-Purpose Lubricant on anti-friction bearings, plain bearings, and most other parts which require grease lubrication simplifies the lubricant inventory problem and permits lubrication intervals to be increased because of its favorable advantages of lubricity, adhesiveness to metal surfaces, heat stability (does not melt at 500 F), and moisture resistance (does not wash out or emulsify in the presence of water or steam).

Louis P. Batson Co., 3978 Park Place Branch, Greenville, S. C.

Do you want more data? Write ◂ or use card on page 149; list G-115

Converts existing wool spindles to paper tubes



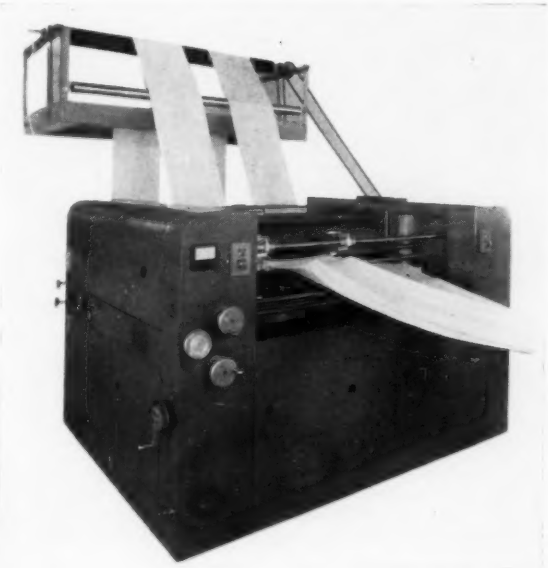
Left to right: Spindle equipped with adapter and brake, empty paper tube, full paper tube, conventional spindle (without adapter and brake), empty wood bobbin, full wood bobbin. Note difference in size of full bobbins.

A spindle adapter for changing present woolen and worsted spinning frames from wooden bobbin to paper tube spinning offers these benefits: Paper tube holds 20 per cent more yarn than the wooden bobbin, yet a full paper tube weighs less than a full wooden bobbin; less downtime for doffing; a brake built into the adapter provides greater operator safety and permits higher operating speeds.

Joel S. Perkins & Son, 528 Nicholson Rd., Gloucester, N. J.

Do you want more data? Write ◂ or use card on page 149; list G-116

Uniformly pads finishes on tubular knit goods



Recently introduced for padding tubular knit goods with permanent and non-permanent finishes was the Tube-Tex Tri-Pad, a three-roll unit offering thorough penetration and greater uniformity in quality. Providing an operating width of 60" and speed of 100 ypm, this padder eliminates the human element, as no tension can be exerted on the fabric and there can be no loss in width; hence, adjustments are not necessary. Pressure is

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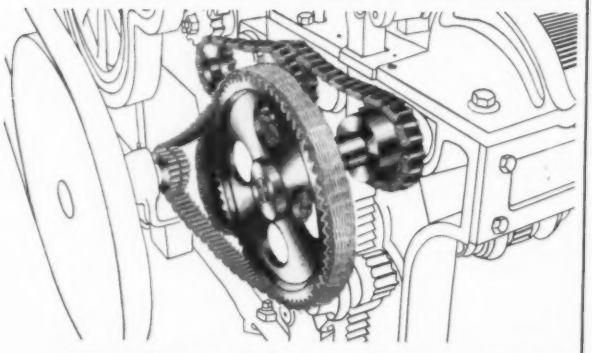

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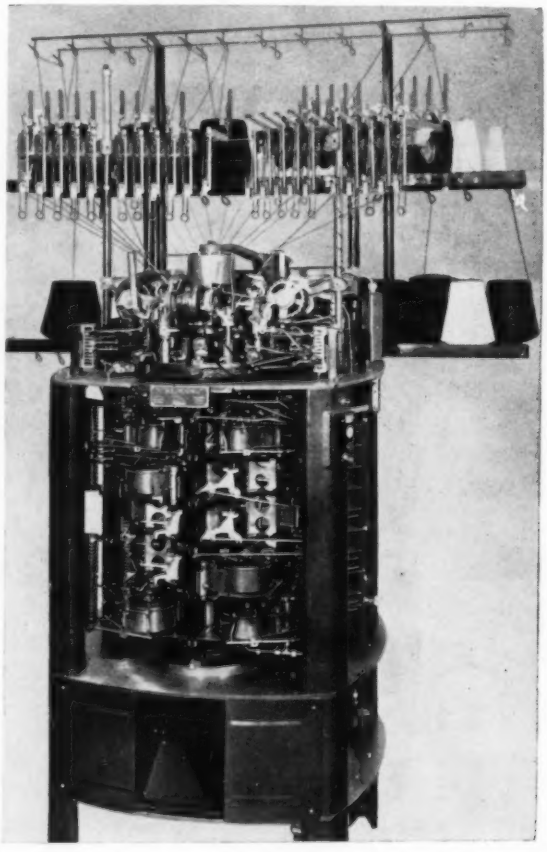
applied pneumatically and the amount is indicated in lb/linear inch with detection at point where roll contacts cloth.

After passing through the first nip in the horizontal arrangement of the three rolls, the fabric is impregnated with the finishing solution, which is contained in the area between the first and middle rolls. Then the fabric hugs the middle roll to enter the second and final nip for extraction.

Tubular Textile Machinery Corp., 33-61 54th St., Woodside, L. I., N. Y.

Do you want more data? Write ◂ or use card on page 149; list 6-117

Versatile inlaid patterning sock knitter



Outstanding feature of the new "Reading" CK-C circular knitting machine for men's and boys' socks is a multipurpose patterning attachment which is capable of producing a large variety of inlaid patterns, using overplaid and circular suturing simultaneously. Average production per 8-hour shift, depending upon size and style, is 5 to 7 dozen pairs with 84 needles, 3½ to 5 dozen with 112 needles, and 2½ to 3½ dozen with 168 needles.

Also known as the Model 61 CK-A, this fully automatic knitting machine has four independently-controlled feeds (single feed in heel and toe), individual electric controlled clamp and cutter for each feed, electric stop motion at yarns and needles, larger yarn finger control drums, end-of-cycle control and indicator light, triple step jack group selector, ladder type control arm,

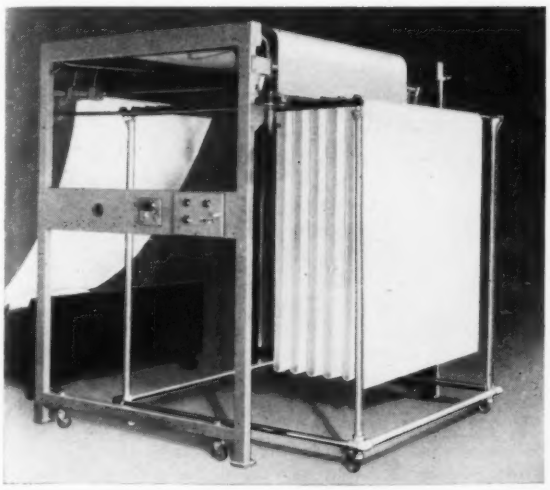
For further information use Handy Return Card, Page 149

new type rod clips, air device for eliminating knit-in ends, and automatic lubrication.

Textile Machine Works, Reading, Pa.

Do you want more data? Write ◆ or use card on page 149; list G-118

Automatic festooner for high-pile fabrics



Hand-framing of high-pile fabrics is eliminated with an automatic festooning machine which can be easily moved to different locations in the mill. Known as the Turbo Model J Portable Auto-Festooner, the machine continuously and automatically drapes the fabric over a festooning truck in even folds and shuts off automatically when the truck is full.

A setting on the control panel is used to determine the length of the drape over each bar. As each fold is completed, an indexing mechanism moves the festooning truck forward to accept the next fold. Each truck will hold 60 yards of 64" material.

Turbo Machine Co., Lansdale, Pa.

Do you want more data? Write ◆ or use card on page 149; list G-119

Ultra-sensitive single-end yarn monitor

A new single-end yarn monitor for use on draw twisters, winders, spinning and twisting frames, etc., detects yarn defects as fine as a broken filament. Designated the "Scan-A-Fil," the unit monitors every package of yarn produced on the machine, and defects can be counted and/or recorded. The defect sensing device is not affected by temperature or humidity.

Fabrionics Corp., Park Ave., Huntington, L. I., N. Y.

Do you want more data? Write ◆ or use card on page 149; list G-120

Space-saving, dependable variable speed drive

A static-powered variable speed drive, called the V-S Statatron, offers dependability, compactness, low maintenance cost, quiet and vibrationless operation of the control unit, and dynamic braking which gives fast, smooth slow-downs and stops. Available in ratings from 1 to 200 hp, the Statatron consists of a d-c motor, operator's station, and control cabinet. It uses silicondiodes

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Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17, Ohio.

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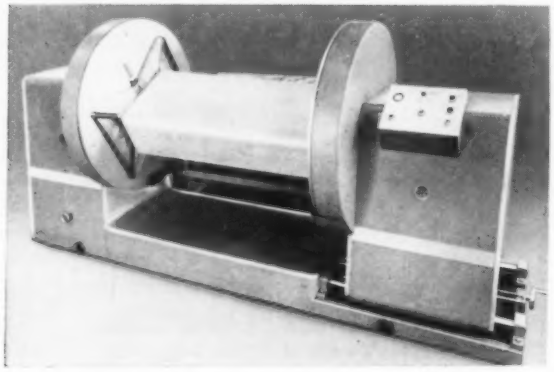
Frames pile fabrics automatically



Sixty yards of pile fabric can be framed in approximately three minutes with the new Turbo Automatic Framing Machine. No operator is required. The machine takes over when the material is in the starting position, then shuts off automatically when the frame is full. Framing speed is up to 20 yards per minute.

Patented non-returnable frames, available for use in the machine, holds 50 or 60 yards of fabric, in widths from 54 to 62 inches. The frames have patented cone dividers that protect the fabric by holding it firmly in position. The cone dividers make it possible to remove any quantity of fabric from the frame, and still store upright until the frame is empty. Frames are shipped in containers which protect the fabric in transit and in storage.

Turbo Machine Co., Lansdale, Pa.

Do you want more data? Write or use card on page 149; list 6-122

Net weight scale has many mill applications

A five-pound capacity net weight scale for use in checkweighing, filling, issuing predetermined quantities, and count-by-weight operation is available. Designated the Speedweigh Model 3012, the lightweight and portable unit is designed to provide more efficient cost control of materials by eliminating repeated small weighing errors. Weight sensitivity to 1/64 oz.

Toledo Scale, Division of Toledo Scale Corp., Toledo 12, Ohio.

Do you want more data? Write or use card on page 149; list 6-123

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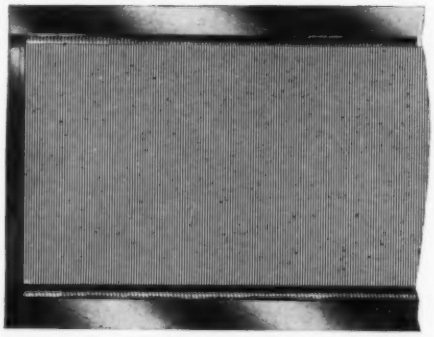

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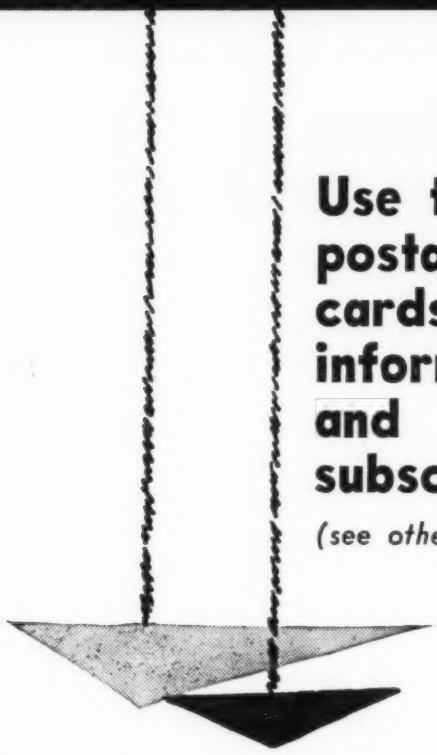

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FREE BOOKLETS

7-1 ROVING CANS—Technical article describes why roving cans should be carefully selected to avoid a profit leak. National Vulcanized Fibre Company, 1061 Beech Street, Wilmington 99, Delaware.

7-2 SLEEVE BEARINGS—Folder announces two new types of self-aligning and self-lubricating sleeve bearings in flanged and pillow block types. Link-Belt Company, Department PR, Prudential Plaza, Chicago 1, Illinois.

7-3 BRUSHING TOOLS—Book explains the advantages of quality brushing tools and shows a number of typical successful applications. M. W. Jenkins' Sons, Inc., P. O. Box 68, Department 19, Cedar Grove, Essex County, New Jersey.

7-4 PNEUMATIC UNLOADING—Bulletin describes and illustrates a new portable "Breather" used during the pneumatic loading or unloading of Airslide Cars. Bulletin A-22, Fuller Company, Catasauque, Pennsylvania.

7-5 DOCTOR BLADES—Booklet describes dependable new source of supply for high quality doctor blades. John W. Bolton & Sons, Inc., Machine Knife Division, Lawrence, Massachusetts.

7-6 POWER STRAPPING TOOLS—Brochure gives pictorial evidence of profitable product use by the shipping, packaging and materials handling industries. Booklet AD-300, Acme Steel Company, Steel Products Division, 135th & Perry Avenue, Chicago 27, Illinois.

7-7 YARN INSPECTOR—Brochure describes multifilament yarn defects and their detection with transistorized ultra yarn inspector. Foster Machine Company, Westfield, Massachusetts.

7-8 NYLON CORE BELTING—Booklet features comprehensive engineering and application data, including graphs to determine proper type belt. Extremultus, Inc., 130 Coolidge Avenue, Englewood, New Jersey.

7-9 VIBRATION CONTROL—Catalog describes complete line of machinery mounts and includes tests made by a leading testing laboratory concerning physical properties. Clark-Cutler-McDermott Company, Franklin, Massachusetts.

7-10 SPEEDWEIGH SCALE—Brochure describes five-pound capacity net weight packing scale, designed for checkweighing, filling, etc. Brochure 2112, Toledo Scale Corporation, Toledo 12, Ohio.

7-11 WETTING AGENTS—Brochure describes comprehensive line of wetting agents for diversified industrial use, including textiles. Brochure ISP-45, Nopco Chemical Company, 60 Park Place, Newark 1, New Jersey.

7-12 BETTER HANDLING—"Management Guide to Productivity" permits exposure of unwarranted materials handling expense, and proposes corrective measures. Yale Materials Handling Division, Yale & Towne Manufacturing Company, 11,000 Roosevelt Boulevard, Philadelphia 15, Pennsylvania.

7-13 MACHINERY REPAIRS—Booklet offers solutions for the problem of getting machinery repaired and back into production fast . . . and at minimum cost. La Salle Steel Company, P. O. Box 6800-A, Chicago 80, Illinois.

7-14 DYE BOARDER—Booklet describes the Turbo Dye Boarder and describes advantages in bringing automation to the hosiery industry by "Turbonizing". Turbo Machine Company, Lansdale, Pennsylvania.

7-15 FOSTER 506 WINDER—Bulletin tells how problem of winding high grade knitting yarns on preferred steep taper cones has a practical answer in the Foster 506. Foster Machine Company, Westfield, Massachusetts.

7-16 PRESSURE AND VACUUM GAGE—Catalog describes instruments for measuring, indicating, recording and controlling pressures and vacuums. Catalog C70-1a, Minneapolis-Honeywell Regulator Company, Industrial Division, Wayne & Windrim Avenues, Philadelphia 44, Pennsylvania.

7-17 SAPPHIRE IN TEXTILES—Bulletin describes the use of synthetic sapphire in thread handling and other applications. Linde Company Division, Union Carbide Corporation, 270 Park Avenue, New York 17, New York.

7-18 TOE CLOSING MACHINES—Bulletin describes Merrow M-4D-45 machines for closing toes on men's, infants' and children's hose. Merrow Machine Company, 28 Laurel Street, Hartford, Connecticut.

7-19 ELECTRONIC AIR CLEANER—Booklet describes electronic precipitation as a method of removing dust and smoke from the air through electrostatic force. American Air Filter Company, Louisville, Kentucky.

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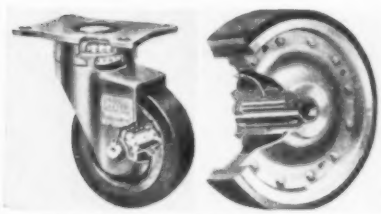

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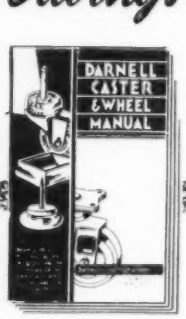

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BOOKLETS

raw stock to roving

T-101 LUMMUS PEPPER - SHAKER OPENER. Gives complete details and photographs. Aldrich Machine Works, P. O. Box 750, Atlanta, Ga.

T-102 STATIC ELIMINATION. How to eliminate static safely and inexpensively. Simco Co., 920 Walnut St., Lansdale, Pa.

T-105 VERSA - MATIC DRAWING FRAME. Describes drafting elements, quality of sliver, roving and yarn possible. Saco-Lowell Shops, Textile Machinery Div., Easley, S. C.

T-106 SARGENT OPENER. Describes opener with rotary evener and stripper. C. G. Sargent's Sons Corp., Graniteville, Mass.

T-107 FEATHERTOUCH DRAFTING. How to get "highest production per frame at lowest cost." Ideal Industries, Inc., Bessemer City, N. C.

T-112 ADVANTAGES OF ALDRICH PICKERS. Good technical text, comprehensive pictures. Aldrich Machine Works, P. O. Box 750, Atlanta, Ga.

T-113 NEW CONDENSER TAPE. Describes Supr-O-Tape, an impregnated fabric condenser tape. Benjamin Booth Co., Allegheny Ave. & Janney St., Philadelphia 34, Pa.

T-119 FIBER METER. Automatic weighing and blending assures quality, holds variation to 1%. James Hunter, Inc., P. O. Box 298, Mauldin, S. C.

T-120 PIN DRAFTERS. Textile job report No. 21 tells how Warner & Swasey Pin Drafters help modify jute systems for carpet yarns. Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio.

T-121 UNIVERSAL CARD COILER. Literature describes both head and base swivel for adjustment. Includes data on 90-day free trial. McDonough Power Equipment, Inc., McDonough, Ga.

T-122 RECONDITION OPENING & CLEANING. Bulletin gives whys and wherefores of reconditioning your opening and cleaning lines. Special attention given to each machine with suggestions as to parts replacement. Saco-Lowell Shops, Replacement Parts Div., Box 327, Greenville, S. C.

T-123 COILER CONVERSIONS. Full facts on low initial cost conversion to larger coiler cans. Lists advantages, has complete description. Southern States Equipment Corp., Hampton, Ga.

T-124 CARD DRIVE. Bulletin 301-a describes simple, safe, efficient individual card drive. Southern States Equipment Corp., Hampton, Ga.

T-132 PROCTOR SUPER PICKER. Data sheet gives details of the Proctor Super Picker for use on slabs of baled cotton, or wool and synthetic blends in layers up to 12" thick. Proctor & Schwartz, Inc., 7th St. and Tabor Rd., Philadelphia 20, Pa.

yarn and warp making

T-201 PRODUCTS FOR SPINNING AND WEAVING. Complete line, applications, advantages shown. Dayco Corp., Textile Div., Dayton, Ohio.

T-202 NEW BOBBIN MANUAL. Complete bobbin guide. Lestershire Spool Division, National Vulcanized Fibre Co., Wilmington 99, Delaware.

T-203 SPINDLE OIL. "Gulfspin" insures against excessive wear and eliminates spindle wobble. Gulf Oil Corp., Gulf Bldg., Houston, Texas.

T-205 HIGH SPEED AUTOMATIC QUILLER. Lists advantages and dimensions of "Autocopser." Terrell Machine Co., Inc., P. O. Box 928, Charlotte, N. C.

T-208 PACKAGED SPINNER MODERNIZATION. Details on Collecto-Vac, Open-Aire Creels, Cross-Jet Cleaner, Air Conditioning Bahnson Company, Winston-Salem, N. C.

T-209 SECTIONAL WARPER. Describes full width and sectional warpers for knitting, weaving. Robert Reiner, Inc., Weehawken, New Jersey.

T-210 CONICAL RINGS AND FLYERS. Complete details and specifications. Herr Manufacturing Co., Inc., 318 Franklin St., Buffalo 2, New York.

T-211 PRECISE WINDING MACHINE. For winding pineapple or straight cones and tubes of synthetics. Foster Machine Co., Westfield, Mass.

T-212 AUTOMATIC .. CLEANING EQUIPMENT. Working details and advantages of the Tri-Rail Cleaner. American MonoRail Co., 111 East 200th St., Cleveland 17, Ohio.

T-216 SPINNING FRAME CONVERSIONS. Big-package, new frame results at half the cost. Meadows Mfg. Co., P. O. Box 10876, Station A, Atlanta, Ga.

T-217 COLLECTO-VAC. New development collects line, fly and broken ends. The Bahnson Company, Winston-Salem, N. C.

T-219 SPINNING AND TWISTER RINGS. Complete details, pictures, price list. Whitinsville Spinning Ring Co., Whitinsville, Mass.

T-223 FACTS ABOUT YOUR FLYERS AND SPINDLES. Advantages of smooth flyer and spindle operation. Ideal Machine Shops, Bessemer City, N. C.

T-227 SPINDLE OILING MACHINE. Features and advantages noted. Wicaco Machine Corp., 4800 Stenton Ave., Wayne Junction, Philadelphia 44, Pa.

T-228 HANDY SPINNING REFERENCE. Shows traveler speeds, sizes of ring flanges. Saco-Lowell Shops, Parts Replacement Division, P. O. Box 327, Greenville, South Carolina.

For further information use Handy Return Card, Page 149

BOOKLETS

slashing—weaving—tufting

T-229 **UNIRAIL UPTWISTER.** Higher yarn quality and better packages at faster speeds. Leesona Corp., P. O. Box 1605, Providence, R. I.

T-230 **PRECISION TEXTILE WINDING.** Tensions and density control for winding rubber cones. Kidde Textile Machinery Corp., Farrand St., Bloomfield, N. J.

T-231 **CONE WINDER.** Describes Model 102 winder, including applications. Foster Machine Co., Westfield,

T-232 **SHORT CUT TO STAPLE FIBER SPINNING.** Ten steps in operation of the Tow Stapler. Turbo Machine Co., Lansdale, Pa.

T-233 **WEAVER'S KNOTTER.** Instructions as to use, description. A B. Carter, Inc., Gastonia, N. C.

T-234 **TEXTILE ROLL COVERINGS.** Describes complete line as well as other mill supplies. Armstrong Cork Co., Industrial Div., Lancaster, Pa.

T-239 **LARGE PACKAGE TWISTER.** Information on new anti-friction Jumbo Twister which carries a 14" bobbin with a 12" build. Meadows Mfg. Co., P. O. Box 10876, Sta. A. Atlanta, Ga.

T-241 **PACEMAKER TWISTERS.** Folder gives details on high production, outlines notable features. Whitin Machine Works, Whitinsville, Mass.

T-242 **RING SPINNING FRAME.** Folder presents description, illustrations and specifications of up-to-date Simplex ring spinning frames. Davis & Furber Machine Co., North Andover, Mass.

T-243 **ANTI-FRICTION TWISTER BEARINGS.** Find out how bearings helped make The Meadows Twister almost friction-free. Fafnir Bearing Company, New Britian, Conn.

T-246 **BETTER BEAMS.** Information on three ways to make better beams. Kidde Textile Machinery Corp., Farrand St., Bloomfield, N. J.

T-250 **SPINNING MODERNIZATION.** Booklet shows how lower costs and improved quality are obtained by spinning modernization. Roberts Company, Sanford, N. C.

T-255 **NEW BOBBIN HOLDER.** Details on streamlined, positive latching bobbin holder. Whitehead Die Casting Co., 1140 Zonolite Rd., Atlanta, Ga.

T-256 **HUMIDIFIER PROTECTION —** Brochure tells how "Rustex" can stop rust and corrosion and prevent discolored water in your humidifying system. Odorless and completely harmless to personnel, or goods. Anderson Chemical Co., Inc., Box 1424, Macon, Georgia.

T-257 **COMETSA SPINDLES.** Bulletin gives details of high-precision, vibration free Cometsa spindles. Mr. Edward B. Rock, Terry Hill Road, Lake Carmel, New York, N. Y.

T-301 **COUNTING AND MEASURING DEVICES.** Wide range of counting devices for all types of textile machinery. Veeder-Root, Inc., Hartford, Conn.

T-302 **LOOM SUPPLIES.** Describes complete line. E. H. Jacobs Mfg. Co., P. O. Box 3096, Charlotte, N. C.

T-304 **LOOM PRODUCTION CHARTS.** Celluloid card shows yards per loom per week. Ralph E. Loper Co., Greenville, S. C.

T-306 **THE STORY OF STARCHES.** History and information on manufacture and use of starches National starch & Chemical Corp., 750 Third Ave., New York 17, N. Y.

T-309 **PENFORD GUMS IN TEXTILES.** Describes their excellent properties for warp sizing spun yarns. Penick & Ford Ltd., Inc., 760 Third Ave., New York 17, New York.

T-314 **LOOM REED BOOKLET.** Describes in detail a variety of reeds. Steel Heddle Mfg. Co., 2100 West Allegheny Ave., Philadelphia 32, Pa.

T-315 **COCKER EQUIPMENT.** Information on warp sizer, beam warper, creels, tensions, back-winders, etc. Cocker Machine & Foundry Co., Gastonia, N. C.

T-318 **FORMULAS FOR SLASHING ARNEL.** Includes also information on warping, weaving and quilling. Textile Sales Dept., Celanese Corp. of America, P. O. Box 1414, Charlotte 1, N. C.

T-319 **ECLIPSE STARCHES FOR TEXTILES.** Data sheet describes use of thin-boiling starches in the textile industry, with particular emphasis on warp sizing. Physical and chemical data included. A. E. Staley Mfg. Co., Decatur, Ill.

T-321 **COCKER SLASHERS.** Complete specifications and advantages, including allied equipment. Cocker Machine & Foundry Co., Gastonia, N. C.

T-322 **MOUNTS FOR LOOMS.** Vinyl mount eliminates need for bolts or paste. Clark, Cutler, McDermott Co., 106 W. Central St., Franklin, Mass.

T-323 **UNIFIL LOOM WINDER.** Describes new concept of filling preparation which needs no quilling area. Leesona Corp., P. O. Box 1605, Providence, R. I.

T-324 **ALIGNING LAYS.** Setting instructions for step-by-step aligning. Draper Corporation, Hopedale, Mass.

T-325 **TRAVELING LOOM CLEANER.** Advantages of the new Oscillaire loom cleaner. Parks-Cramer Co., Fitchburg, Mass.

T-326 **DRAPER REPAIR PARTS CATALOG.** Contains Illustrations covering all mechanisms and construction with complete listings. Draper Corporation, Hopedale, Mass.

T-328 **TEXTILE MACHINERY PARTS CATALOG.** Describes complete line of Dayco and Thorobred textile parts. Dayco Corp., Dayton, Ohio.

T-329 **COUNTING DEVICES.** Describes complete line of counters for

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BOOKLETS

every application. Trumeter Company, 38 W. 32nd St., New York 1, New York.

T-331 **STATIC BARS.** Humorously illustrates how static can be overcome. The Simco Co., 920 Walnut St., Lansdale, Pa.

T-332 **CARE OF DRAPER SHUTTLES.** Describes how longer, trouble-free service may be obtained. Draper Corporation, Hopedale, Mass.

T-346 **FACTS ON NONWOVENS.** Fact file on non-wovens tells of new machinery, new methods of handling fibers, new bonding agents, etc. Curlator Corporation, Textile Division, East Rochester, N. Y.

T-347 **New DRYING SYSTEM.** Describes high capacity, custom engineered drying equipment for tufted plants. Dalton Sheet Metal Co., Inc., Dalton, Ga.

T-351 **AUTOMATIC STOP MOTION.** Complete information available on automatic stop motion for Titan warp tying-in machine. Edda International Corp., 468 Fourth Ave., New York 16, N. Y.

T-353 **BACKING FOR TUFTEDS.** How to get your tufting necessities with one telephone call. Fulton Cotton Mills, P. O. Box 1726, Atlanta 1, Ga.

T-355 **NON-WOVEN FABRICS.** Booklet gives outline of nature and history of non-woven and the manufacturing techniques of today. Booklet 56-219A. Chemical Div., Goodyear Tire & Rubber Co., Akron 16, Ohio.

T-358 **LOOM SUPPLIES.** Information on rod lubricant and applicator, sponge leather bunter, picker. Garland Mfg. Co., 54 Water St., Saco, Me.

T-362 **SIZE THAT SATISFIES.** Information on getting the correct size package for your mill. Also on Bingham line of slasher rolls. Stodghill & Co., 716 Ponce de Leon Place, Atlanta, Georgia.

T-363 **RUBBER COVERED SLASHER ROLLS.** Handy booklet tells how to get longer life and better performance from rubber covered rolls. Includes data on handling storing and grinding. Stowe-Woodward, Inc., Dept C., 181 Oak St., Newton Upper Falls 64, Mass.

T-364 **CONTINUOUS STARCH COOKER.** Booklet shows how the use of continuous cookers for starch assures accurate control, economy, low maintenance in warp sizing and finishing. Clinton Corn Processing Company, Clinton, Iowa.

knitting

T-403 **RASCHEL KNITTER.** Describes new Raschel-type knitting machine. Kidde Textile Machinery Corp., Inc., Farrand St., Bloomfield, N. J.

T-406 **NEEDLE OIL DOES NOT STAIN.** Details on "Gulftex 39" developed for knitting mills. Gulf Oil Corp., Gulf Bldg., Houston, Texas.

T-407 **KNITTING MACHINES.** Information on Wildman "TFS" 30" single section F-F machines and "AL" 30" diameter 32-feed "single purpose" circular interlock machine (rib type) Wildman-Jacquard Div., Draper Corp., Hopedale, Mass.

T-410 **"READING" TYPE 60 F-F KNITTING MACHINE.** Information about the new "Reading" Type 60, 28-section automatic full-fashioned hosiery knitting machine. Write Textile Machine Works, Reading, Pa.

wet processing

T-500 **WEBB GUIDE SYSTEMS.** Folio No. EG-84 describes webb guide systems for cloth applications. G.P.E. CONTROLS, INC., 240 E. Ontario St., Chicago 11, Ill.

T-502 **FINISHING MACHINERY.** Text and photographs of complete line of machinery. Marshall and Williams Corp., 46 Baker St., Providence, R. I.

T-503 **WATER ANALYSIS.** Includes tables, conversion factors, indicators, standard solutions. Solvay Process Div., Allied Chemical Corp., 61 Broadway, New York 6, N. Y.

T-504 **UREA FORMALDEHYDE.** Literature on urea formaldehyde or U.F. concentrate-85. Dept. CUFI-29-1. Nitrogen Div., Allied Chemical Corp., 40 Rector St., New York 6, New York.

T-506 **CATIONIC SURFACE ACTIVE AGENT.** Describes Uversoft "D." Harshaw Chemical Co., 1945 East 97th St., Cleveland 6, Ohio.

T-508 **PEROXIDE BLEACHING SYSTEM.** Illustrates and describes this continuous system. E. I. du Pont de Nemours & Co., Electrochemical Dept., Wilmington, Del.

T-510 **TEXTILE CHEMICALS.** Describes leading products for wet processors. Royce Chemical Co., Carlton Hill, N. J.

T-512 **DEPUMA.** Decribes odorless, viscous, non-evaporating emusion for anti-foam. Koppers Co., Inc., Chemicals & Dyestuffs Div., Porter Bldg., Pittsburgh 19 Pa.

T-513 **CATALYST AC-6.** Tells how curing efficiency may be stepped up as much as 25%. Monsanto Chemical Co., Plastic Division, Springfield 2, Mass.

T-514 **SODA ASH BULLETIN.** Contains useful data covering this subject. Solvay Sales Division Allied Chemical Corp., 40 Rector St., New York 6, New York.

T-516 **ALUMINUM CHELATE PEA-1.** Technical data sheet tells how aluminum Chelate PEA-1 may be used with advantage in many applications where aluminum in proplate is unsatisfactory. Harshaw Chemical Co., 1945 East 97th St., Cleveland 6, Ohio.

T-517 **CHEMICAL CATALOG.** Lists products with chemical composition, properties and applications. Antara Chemicals Div., General Aniline & Film Corp., 435 Hudson St., New York 14, New York.

For further information use Handy Return Card, Page 149

BOOKLETS

T-519 HYDRAULIC POWER UNITS. Describes unit for operating hydraulic textile machines. B. F. Perkins & Son, Inc., Holyoke, Mass.

T-522 CUT WATER TREATMENT COSTS. Describes the control of scale, slime, algae and corrosion. Oakite Products, Inc., 126C Rector St., New York 6, New York.

T-526 PRODUCTS FOR TEXTILE IMPROVEMENT. Describes products and services designed to provide better fabrics. B. F. Goodrich Chemical Co., 3135 Euclid Ave., Cleveland 15, Ohio.

T-527 SODIUM HYDROSULFITE. Literature and test samples are available on "T-C Hydro." Tennessee Corp., 617-629 Grant Bldg., Atlanta, Ga.

T-528 ETHANOLAMINES. Lists application, chemical and physical properties. Nitrogen Division, Allied Chemical Corp., 40 Rector St., New York 6, New York.

T-531 ROTARY DYEING MACHINE. For use in dyeing hosiery, hats, gloves, socks, etc. Turbo Machine Co., Lansdale, Pa.

T-534 DYEING AND FINISHING MACHINERY. Complete line presented in series of catalogs. Birch Brothers, Inc., 32 Kent St., Somerville 43, Mass.

T-535 DYEING, BLEACHING AND DRYING EQUIPMENT. Complete line for cotton, wool and synthetics described. Color pictures. Morton Machine Works, 1718 3rd Ave., Columbus, Ga.

T-536 NAPHTHOL RATIOS SLIDE CHART. Quickly and accurately enables operators to determine Naphthol Ratios. Alliance Color & Chemical Co., 33 Ave. P, Newark 5, New Jersey.

T-540 PENFORD FINISHING GUMS. Complete data, including physical properties. Penick & Ford Ltd., Inc., 750 Third Ave., New York 17, New York.

T-541 REGENERATION OF ZEOLITE WATER SOFTENERS. Explains advantages of Lixate Process. International Salt Co., Scranton, Pennsylvania.

T-542 DYEING SNYTHETIC FIBERS. Detailed analysis of methods and materials. General Dyestuff Co., 435 Hudson St., New York 14, New York.

T-543 INDUSTRIAL BRUSHES. Features use on shears, printing machines. M. W. Jenkins' Sons, Inc., 444 Pompton Ave., Cedar Grove, N. J.

T-544 WASTE HEAT RECOVERY. Describes system of waste heat recovery from polluted water. Ludell Mfg. Company, 5200 West State Street, Milwaukee, Wis.

T-545 WASHERS FOR SCOURING, BLEACHING, ACIDIFYING. Describes high capacity, continuous process washers. C. G. Sargent's Sons Corp., Graniteville, Mass.

T-546 NAPHTHOL FOR LIGHTFAST BROWNS. Booklet describes new, straight, non-substantive naphthol. Naphthol As-BN, for the continuous naphtholation of cotton and rayon piece goods in the dyeing of economical, fast-to-light browns. General Dyestuff Co., 435 Hudson St., New York 14, New York.

T-547 SOFTENER LUBRICANT, NAPPING AID. Technical information available on softener, lubricant and napping aid for natural and synthetic fibers, yarns and fabrics. Nopco Chemical Co., Harrison, N. J.

T-554 INSTRUMENT CATALOG. Complete information on industrial instrument accessories and supplies. Includes specifications, parts numbers and prices. Catalog 500, Foxboro Co., Foxboro, Mass.

T-556 HUNTER DYEING EQUIPMENT. Describes fully with diagrams Hunter Model A Dye Becks, Hunter No/Lap Reels, Model S Dye Kettles. Open Width Dye Kettles. Sample Dye Kettles. James Hunter Machine Co., North Adams, Mass.

T-557 HIGH ACTIVITY CATALYST. Technical bulletin describes new catalyst AC-6 which provides increased activity, excellent bath life, minimum odor formation, etc. Monsanto Chemical Co., Plastics Div., Springfield, Mass.

T-558 CATIONIC DYE LEVELER. Bulletin TX-34 gives new information on dye leveler for acid colors on nylon tricot and wool through use of Nopco 1425-B. Nopco Chemical Co., Textile Chemicals Div., Harrison, N. J.

T-561 PUMP POURABLE PASTES. Bulletin tells how Moyno pumps can pump any textile liquid that can be forced through a pipe, even if highly viscous or corrosive. Robbins & Myers, Inc., Springfield, Ohio.

T-563 POLYETHYLENE FINISHING AGENT. Booklet contains information needed to adopt Emulsifiable A-C polyethylene as a finishing agent to any particular process. Semet-Solvay Petrochemical Div., Allied Chemical Corp., 5th Floor T, Rector Street, New York 6, N. Y.

T-564 HYDROGEN PEROXIDE BLEACHING. Booklet discusses advantages, operating details and savings in chemical costs of Activated Hydrogen Peroxide Bleaching Process for Cotton Solvay Process Div., Allied Chemical Corp., 61 Broadway, New York 6, N. Y.

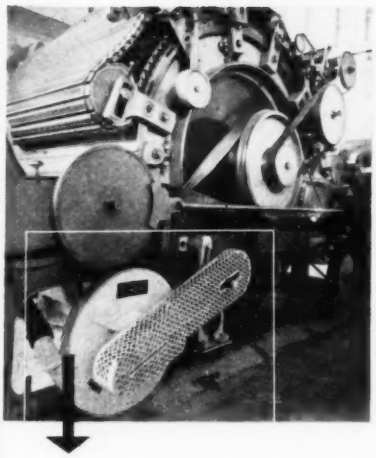
T-566 ETHYLEX GUMS. Brochure describes properties of hydroxy ethyl ether derivatives of corn starch. Applications of these noncongealing gums in warp sizing and finishing covered. A. E. Staley Mfg. Co., Box 151, Decatur, Ill.

T-572 DYEING MACHINERY FOR EVERY PURPOSE. Illustrated literature available on complete line of automatically controlled machinery. Gaston County Dyeing Machine Co., Stanley, N. C.

T-576 YARN PREPARATION. Describes products for yarn preparation, printing, finishing. Polymer Industries, Springdale, Conn.

T-577 STAINLESS DRY CANS. Information on stainless steel, 75 psi, reverse dished, head dry cans. Can be furnished Teflon-coated if desired. Sims Metal Works, West Point, Ga.

T-579 AUTOMATIC GUIDING EQUIPMENT. Catalog shows various types of automatic guiding equipment for accurate cloth guiding. Fife Mfg. Co., Inc., P. O. Box 9815, Oklahoma City, Okla.



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BOOKLETS

T-580 AIR SLASHER DRYER. Shows construction and operating details. Proctor & Schwartz, Inc., 7th St. and Tabor Rd., Philadelphia 20, Pa.

T-581 BUTT-TACKING SEWING MACHINE. Describes operation, installation of single thread butt-tacking sewing machine. The Merrow Machine Co., 28 Laurel St., Hartford, Conn.

fibers and yarns

T-601 FORTISAN-36, NEW TEXTILE FIBER. Includes charts, diagrams, text, presents technical properties. Textile Sales Dept., Celanese Corp. of America, P. O. Box 1414, Charlotte, N. C.

T-602 CAPROLAN NYLON HEAVY YARNS. Describes strength, long flex life and ready dyeability. Fiber Sales Dept., National Aniline Div., 261 Madison Ave., New York 16, N. Y.

T-604 THE CHEMSTRAND NYLON STORY. Describes the birth and growth of Chemstrand Nylon. Chemstrand Corp., 350 Fifth Ave., New York 1, N. Y.

T-605 COLOR-FAST FIBERS. Further information on "Coloray." Courtauld's solution dyed rayon staple which is a contribution to color fastness in fabrics. Courtaulds (Alabama) Inc., 600 Fifth Ave., New York 20, N. Y.

T-608 TASLAN TEXTURED YARNS. Technical information on dyeing and finishing of new fabrics made with Taslan. E. I. du Pont de Nemours & Co., Wilmington 98, Delaware.

T-609 PROCESSING NYLON STAPLE. Data sheet describes method of processing Du Pont 42 Nylon Staple in blends with cotton. Covers complete operation through sizing. Bulletin N-93. E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.

laboratory

T-701 TESTING INSTRUMENTS. Descriptions of 37 instruments for testing textiles. Custom Scientific Instruments, Inc., 541 Devon St., Kearny, N. J.

T-703 SHADOGRAPH WEIGHING DEVICES. Pictures and information on various types of scales. Exact Weight Scale Co., Columbus 8, Ohio.

T-705 STROBOTAC. Measures speed of rotating, reciprocating or other cyclic motions. General Radio Co., West Concord, Mass.

T-706 YARN COUNT SCALE. Data sheet tells how direct-reading instrument provides fast, accurate method of determining yarn number. Exact Weight Scale Co., Columbus 8, Ohio.

services for management

T-801 FACTORING SERVICE. Details on advantages of factoring, including information on general banking and pension plans. Trust Company of Georgia, Atlanta, Ga.

T-805 PROFIT THROUGH FACTORING. Brochure gives facts on the use of factoring as a modern plan for developing sound business growth and added profits. Walter E. Heller & Co., Dept. TI-2, 105 W. Adams St., Chicago 99, Ill.

T-808 FACTORING. Complete details on services offered as mill factors. L. F. Dommerich, 271 Madison Ave., New York, N. Y.

T-810 THE WONALANCET WAY is the title of an editorial booklet published five times a year dealing with current cotton problems. Write Wonalancet Company, 128 Burke St., Nashua, N. H.

T-812 BEECHCRAFTS FOR 1961. Booklet available from Southern Airways Company shows how Beechcraft executive airplanes can save executives time and money. Write Southern Airways Co., P. O. Box 718, Atlanta, Ga.

T-819 ORGANIZED LUBRICATION PAYS. Planning book entitled "Management Practices that Control Costs via Organized Lubrication" shows how to effect savings in five areas of plant operation. Available from Texaco, Inc., 135 E. 42nd St., New York 17, N. Y.

plant operation

T-902 BELT LACING EQUIPMENT. Includes prices, specifications, etc. Clipper Belt Lacer Co., Grand Rapids, Michigan.

T-903 "MOTOR SELECTOR." How to select a-c motors for specific application. Bulletin B-2103. Reliance Electric & Engineering Co., 24701 Euclid Ave., Cleveland 17, Ohio.

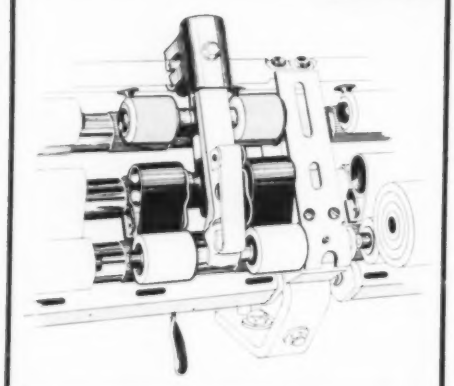
T-904 GEARMOTORS, MOTORGEARS, AND FLUID DRIVES. Catalog supplies complete information on double, triple, and quadruple reduction gearmotors and motorgears. Electrofluid and fluid drives are also explained. Link-Belt Company, Dept. PR, Prudential Plaza, Chicago 1, Illinois.

T-907 WRAP UP LINT PROBLEMS. Automatic lint filter removes lint from air, winds it into disposable roll. Bulletin 234, American Air Fiter Co., 275 Central Ave., Louisville 8, Ky.

T-908 TEXTILE MOTORS. Bulletin describes complete line of textile motors. Diehl Mfg. Co., Finderne Plant, Somerville, N. J.

CleanGuide

PATENTS PENDING



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BOOKLETS

T-909 COMPRESSORS. WB two-stage water-cooled. Space-saving units require modest foundation up to 125 psi and 1150 cfm displacement. Bulletin WB-10. Gardner-Denver Company, Quincy, Illinois.

T-910 MODERN LUBRICATION METHODS. A report to management tells how modern lubrication methods can help save thousands of dollars in three major economic areas of textile plant management. Describes twelve operating advantages of automatic lubrication systems. Lincoln Engineering Co., 4010 Goodfellow Blvd., St. Louis 20, Mo.

T-912 STORY OF NYLON BRISTLE. Tells of discovery and production, with special attention to "Tynex," a form of nylon ideal for use in brushes. M. W. Jenkins' Sons, Inc., 444 Pompton Ave., Cedar Grove, N. J.

T-913 "ONE-SHOT" LUBRICATORS. Bulletin describes wide field of application for one-shot lubricators on machines requiring closely controlled but infrequent oil feed. Bijur Lubricating Corporation, Rochelle Park, N. J.

T-914 INDUSTRIAL GREASES. Describes multi-purpose lithium soap industrial greases. Sinclair Refining Co., 600 Fifth Ave., New York, New York

T-917 BLOWERS AND EXHAUSTERS Full description, including detailed drawings. Buffalo Forge Co., 490 Broadway, Buffalo 5, N. Y.

T-918 PAINT STRIPPING BOOKLET. Explains simplified method of stripping paint. Oakite Products, Inc., 22 Thames St., New York 6, New York.

T-921 CATALOG OF NEEDLE BEARINGS. Design, application for five types of needle bearings. The Torrington Co., Torrington, Conn.

T-924 BALL BEARINGS FOR TEXTILE MACHINERY. Bearings for all phases of textile processing. The Fafnir Bearing Co., New Britain, Conn.

T-925 LUBRICATION OF BEARINGS. Helpful list of do's and don't to prolong bearing life. New York & New Jersey Lubricant Co., 292 Madison Ave., New York 17, New York.

T-931 NEW V-BELT DRIVES. Bulletin contains information on selection and operation of V-belt drives. Covers all types of V-belt drives. Dodge Mfg. Corp., Mishawaka, Ind.

T-932 SMOOTH ACCELERATION, DECELERATION. Describes eddy-current equipment for smooth, stepless acceleration and deceleration. Eaton Mfg. Co., 3307 14th Ave., Kenosha, Wis.

T-937 V-BELTS. Tells how raw materials and finished belts are tested and inspected. Quality control and experimental production covered. Booklet 5-51107, Dept. 794, Goodyear Tire & Rubber Co., Akron 16, Ohio.

T-938 EMERGENCY CHEMICAL CLEANING—Booklet tells how rust, scale and other deposits may be removed from heat exchange equipment, regardless of intricacy. Anderson Chemical Co., Inc., Box 1424, Macon, Georgia.

T-939 BOILER FEEDWATER TREATMENT. Bulletin describes BRAXON & FLAKO internal automatic boiler feedwater treatment and services of trained service engineers in eliminating the problems of scales, sludge, corrosion, etc. Anderson Chemical Co., Inc., P. O. Box 1424, Macon, Ga.

T-940 VARI-SPEED MOTOR PULLEY. Describes variable speed control through use of simplified three-major-part disc-assemblies with only one lubrication point. Reeves Pulley Co., Reliance Electric & Engineering Co., Columbus, Ind.

T-941 BALING PRESSES. Describes complete line of motor-driven and hydraulic baling presses. Logemann Brothers Co., 3150 West Burleigh St., Milwaukee, Wis.

materials handling

T-1005 TRAMRAIL ENGINEERING AND APPLICATION. Data on how Tramrail equipment can cut handling costs. Cleveland Tramrail Div., Cleveland Crane and Engineering Co., 1036 East 289th St., Wickliffe, Ohio.

T-1007 MATERIALS HANDLING FOR TEXTILES. Shows how fibre trucks can increase efficiency, protect products. National Vulcanized Fibre Co., Wilmington 99, Del.

T-1013 TRUCKS DOFF, STORE, BECOME SPOOLER TRAY. Brochure tells how mobile boxes are being used as doff boxes, storage boxes, and spooler trays on Barber-Colman spooler. Fisher Mfg. Co., Hartwell, Ga.

T-1014 CARPET CORES, STORAGE TUBES. Literature on simplified storage and better cores for rugs. Sonoco Products Co., Hartsville, S. C.

T-1015 OVERHEAD CONVEYOR. Catalog features "Cable-Way" Overhead Conveyor which has low-cost, ease of installation, quiet operation and long life. Conveyor Division, The American MonoRail Co., Fourth and Franklin Sts., Tipp City, Ohio.

T-1020 AUTOMATIC WRAPPING. Tells how automatic packaging increases the sales appeal of textile products. Saves labor and materials and adds tamper-proof product protection. Write Hayssen Mfg. Co., Sheboygan, Wis.

T-1021 TUBES, BOBBINS, PIRNS. Information on world renowned yarn carriers, reliable as to stability, dimensions, weight. Emil Adolff (U. S. A. agents: Textube Corp., 695 Summer St., Stamford, Conn.)

T-1022 STRONG CORES. Data on lightweight, quality tubes and cores for textiles. Star Paper Tube, Inc., Rock Hill, S. C.

T-1023 MATERIALS HANDLING. Describes lightweight, durable, smooth products. Spaulding Fibre Co., Inc., Dover, New Hampshire.

T-1024 CONDITIONING TRUCK. Details on all-aluminum, non-rusting conditioning truck. Excel, Inc., Lincolnton, N. C.

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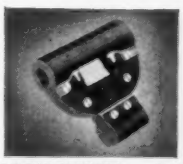

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56 WATER STREET • SACO, MAINE

MILL NOTES

An old hand loom, thought to be between 150 and 200 years old, made entirely of wood, and fastened with pegs and wedges, has been presented to the museum at Andrew Jackson State Park by **The Springs Cotton Mills.**

A $750,000 addition to the north side of Mill No. 4 in West Durham, N. C., has been announced by **Erwin Mills, Inc.** The new building will contain 133,100 sq ft of floor space and will be used to modernize the bleaching, finishing, and sewing departments.

A new building to house part of the existing equipment and additional equipment recently purchased, is being constructed by **Armtex, Inc.,** Pilot Mountain, N. C. Completion is expected by early August.

J. M. Nash Co., Inc., has announced the acquisition of **Sand Knitting Mills Corp.,** Berlin, Wis. Present management will continue to operate the plant.

The machinery and plant of **Grend'Mere (Quebec) Knitting Co., Ltd.,** and its associate company, Grand'Mere Spinning Mills, Ltd., have been purchased by **Magic Hosiery, Ltd.,** Montreal, Canada. Both firms will resume manufacturing operations at an early date.

Davenport Hosiery Mills, Inc. has discontinued operations at the Chattanooga, Tenn., plant. The dyeing and finishing of ladies' hosiery has been transferred to a new plant in Charlotte, N. C. The firm merged with Chadbourn Gotham, Inc., some time ago but will continue to operate as a separate unit.

The Kings Mountain, N. C., plant of **Craftspun Yarns, Inc.,** has been purchased by **Designer Yarns, Inc.** The plant is now producing novelty yarns.

Facilities at the Butner, N. C., plant of **Athol Manufacturing Co.** are being doubled. Upon completion, the Athol, Mass., operations will be transferred to the N. C. location.

A 30,000 sq ft addition to the Gaffney, S. C., plant of **A. P. McAuley Co.** has been announced.

The Cedartown, Ga., plant of **The Goodyear Tire and Rubber Co.,** recently marked 35 years in the industry.

Harriet-Henderson Mills, Henderson, N. C., have established two scholarships, valued at $2,000 each for four years of study in the School of Textiles at North Carolina State College. The awards, each of which will provide $500 a year for each recipient, will be presented to winning contestants from Granville, Warren, Franklin, and Vance counties who wish to enroll.

Carolina Mills, Inc., Maiden, N. C., has announced acquisition of the Statesville, N. C., and Gastonia, N. C., plants of **Trenton Cotton Mills.** The latter firms will be operated as subsidiaries of the Carolina Mills under the management of Caldwell Ragan.

Shuford Mills, Inc., Hickory, N. C., has announced plans to construct a 17,400 sq ft addition to its present plant.

Kenyon (R. I.) Piece Dye Works, Inc., has announced the formation of a new company which will occupy the recently purchased Peace Dale Braid Co. building. The laminating operations of the firm will be handled by the new affiliate.

Kimberly-Stevens Corp. has announced plans for modernizing and equipping the recently acquired nonwoven fabrics plant in New Milford, Conn. New equipment will be installed in the 200,000 sq ft building. Carl H. Rowe has been named plant manager and J. L. Murray will be in charge of production.

Fire recently destroyed the finishing-shipping plant of **Derry Damask Mills,** Gaffney, S. C. Operations have

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MILL NOTES

(from page 158)

been resumed in a rented building until the plant can be rebuilt.

A new firm, **Circle Dyeing and Finishing Corp.,** has moved into the plant of the former Plymouth Dyeing Co., in Paterson, N. J. In addition to box work on nylon, Dacron polyester, and synthetics, the firm plans to install machinery for the processing of silk and silk combinations. Lawrence F. Faragalli is president and Al Gellene, Jr., is general manager.

The Kendall Company has announced plans to spend one million dollars for modernizing and expanding the preparatory departments of the Wateree plant at Camden, S. C. New machinery will be installed and 10,000 sq ft of additional storage space will be built.

The new addition to the John Preston warehouse of **Woodside Mills,** Greenville, S. C., has been completed. The 75,000 sq ft facility can accommodate 22,000 bales of cotton.

One hundred additional employees have been added to the personnel of **Bluemont Knitting Mills,** Galax, Va.

Kayser Roth Hosiery Co., Inc., has announced an expansion program for the Hickory (N. C.) knitting division which will create 60 additional jobs. Approximately 200 machines will be installed in new portion of the plant. Completion is expected by early summer.

A 12,800 sq ft addition is under construction at **Roseboro (N. C.) Spinning Mills.**

SUPPLIER NOTES

Bryce R. Holt, Jr., has formed the **Holt Textile Sales Co.,** an organization for selling man-made and natural textile yarns, fibers, and other related products. The company, located in Dalton, Ga., has been named to represent Rocky Creek Mills of Turnersburg, N. C., on tufting yarn sales.

John E. Hobbs has been elected vice-president of **General Latex and Chemical Corp.**

Spaulding Fibre Co. has announced the opening of a sales branch office in Dallas, Texas. W. Owen Graham, Jr., has been named branch manager.

J. E. Sirrine Co. has awarded a contract for their new office building to be located near the Greenville, S. C., airport.

John C. Pickel has joined the sales force of the Yarn Division of **Collins & Aikman Corp.** and has been assigned to the Pennsylvania, New Jersey, Delaware, and Maryland area. James C. Senter, Jr., will call on yarn customers in North and South Carolina.

William C. Buffing, Jr., treasurer of **National Starch and Chemical Corp.,** has been elected a vice-president.

United States Rubber Co. recently named the **Sam M. Butler Co.** as exclusive selling agent for its synthetic and combed cotton knitting yarns in the Carolinas and Virginia.

Raymond R. Currier has been appointed to the newly-created position of supervisor of textile industry sales, for the chemical division of

Pittsburgh Plate Glass Co. Mr. Currier will be responsible for the development of sales of hydrogen peroxide and other chemicals to the industry.

At the annual meeting of the Vat Dye Institute, J. Robert Bonnar, director of industrial and government

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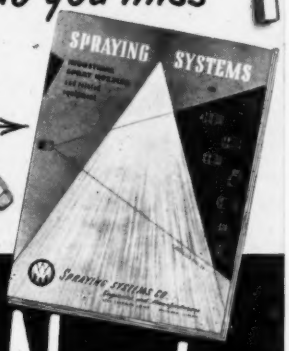

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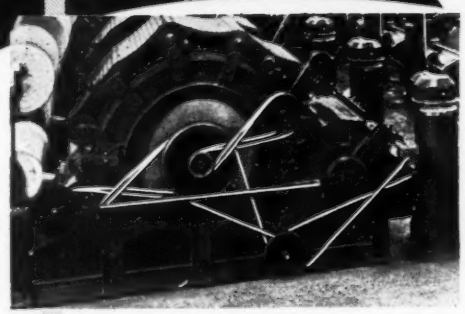

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SUPPLIER NOTES

(from page 160)

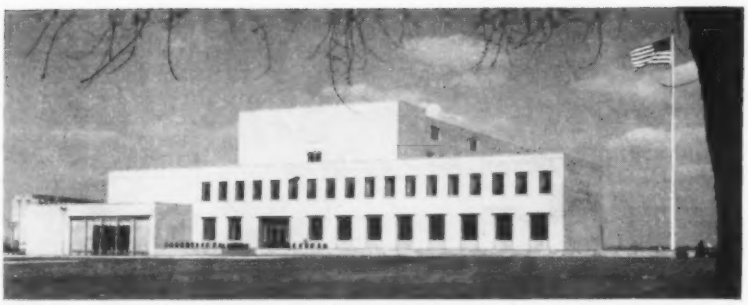
relation for the chemical group of **General Aniline & Film Corp.**, was elected president. Other officers elected were: senior vice-president—Keith R. J. Horner, **Ciba Co., Inc.**; vice-president—Eric R. Herbertson, **Arnold, Hoffman Co.**

W. R. Fuller has been promoted to vice-president of **Morpul, Inc.**

Procter & Gamble Co. has announced plans to build a synthetic detergents plant in Augusta, Ga.

Donald T. Hoffecker has been named field engineer for **Metals & Controls, Inc.**, a corporate division of Texas Instruments, Inc. Mr. Hoffecker will represent the company's line of Klixon electrical and thermostatic controls in the New York City and northern New Jersey area. Kenneth A. Laidman has been appointed to represent the controls and Multi-Layer clad metal products in Canada.

Officials from the **James Hunter Machine Co.** and its subsidiary, James Hunter, Inc., visited N. C. State College School of Textiles recently to inspect the installation of a new fiber meter automatic weighing conversion system in the school's pilot processing laboratory. The equipment was donated to the school by the Hunter firm.



Extensive facilities for new corn and chemical product developments serving the textile industry are provided in the new **A. E. Staley Mfg. Co.** Research Center. The latest testing equipment has been installed for developing new and more useful products.

F. A. Young Machine Co., Inc., was recently awarded the contract for the spinning and twister room modernization of Brower Cotton Mills, Hope Mills, N. C. The program calls for the installation of 2200 additional spindles fully equipped with NYAF drafting and larger package bobbins.

Fred W. Beitner has been appointed vice-president, sales, for the **Trent Tube Co.**, a wholly-owned subsidiary of Crucible Steel Co. of America.

Lincoln L. Redshaw has been appointed president of the **U B S Chemical Co.**, a division of the A. E. Staley Mfg. Co.

A multi-million dollar addition will be constructed at the chlorine-caustic soda plant at Linden, N. J., of the Antara division of **General Aniline & Film Corp.** Completion is scheduled for 1963.

U. S. Electrical Motors Inc., has announced that exact working models of its range drive system have been mounted in a fleet of station wagons for demonstration purposes.

L. Louis Malm has been elected vice-president of **Midland - Ross Corp.**, and appointed general manager of **Industrial Rayon Co.** The two firms merged recently.

Roberts Co. has announced the appointment of Rudel Machinery Co., Ltd., as exclusive sales agents in Canada for the sales of all the firm's yarn making machinery. * * * The firm was recently awarded a contract for 50 new Arrow M-1 spinning frames, totaling 15,000 spindles by Imperial Yarn Mills, Inc., McAdenville, N. C.

Matthew T. Finn has been named manager of paper and light industries sales for the **General Electric Co.** In his new position, Mr. Finn will direct the sales of the company's products and systems to the textile and associated industries.

David Bookshester has been elected vice-president of adhesives sales for **Morningstar-Paisley, Inc.**

Dr. Warren Stubblebine has been promoted to sales manager of the roll division of **Stowe-Woodward, Inc.** Dr. Stubblebine will have the responsibility for both domestic and international sales as well as technical services.

W. G. Kirby has joined the sales force of **Georgia Carolina Oil Co.** Mr. Kirby will call on the trade in Georgia, Alabama, and Tennessee.

Henry R. Hutt has been appointed southern regional sales manager for the chemical division of **International Latex Corp.** Mr. Hutt will have offices in Atlanta, Ga.

Harold A. Bendixen has been elected president of **Clinton Corn Processing Co.**, a division of Standard Brands.

At a recent meeting of the board of directors of **Draper Corp.**, the following officers were elected: executive vice-president and general sales manager—William K. Child; vice-president—J. Craig Huff, Jr.; vice-president and works manager—John W. Hutchinson; assistant treasurer—

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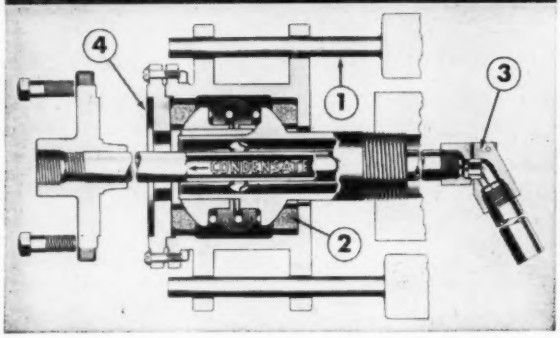

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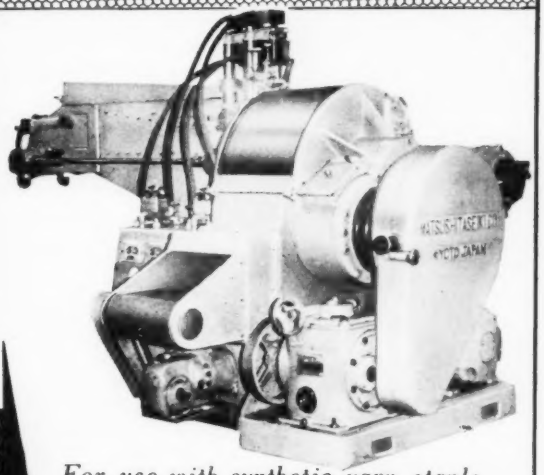

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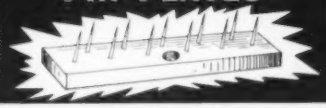

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SUPPLIER NOTES

(from page 162)

Thad R. Jackson; purchasing agent—Russell W. Wade; director of research—Rodney C. Southworth; manager of commercial development—Wayne C. Lewison.

Dr. W. Paul Moeller has been named director of marketing for **AviSun Corp.**

The **Nashua Industrial Machine Corp.** has announced the addition of a new division to be known as Nim-Cor, Inc.

J. Davidge Warfield has been named vice-president of sales for **Veeder-Root, Inc.**

Oliver J. Goldstein has been appointed technical area representative for **Wica Chemicals, Inc.** Mr. Goldstein will be calling on customers in South Carolina, North Carolina, and specific territories in Georgia. W. Brock Amos has joined the staff and has been assigned to the Georgia, Alabama, and Tennessee area.

J. Morgan Ruppe and Addie C. Bland have joined the sales staff of **Louis P. Batson Co.** Mr. Ruppe will call on the trade in central North Carolina and eastern South Carolina, while Mr. Bland will have the territory of western North Carolina and central South Carolina, as well as the extreme portion of Tenn.

The chemical divisions of Air Reduction Company, Inc., have been incorporated into a new division designated **Air Reduction Chemical & Carbide Co.**

Herman L. Poole has been named sales manager of the southern divisional sales office of **Burlap Tubing Manufacturers, Inc.**

The Speedline division of the **Horace T. Potts Co.** was honored recently by the U. S. Patent office for the new method for cold-forming pipe fittings. The firm was one of 16 recently invited to participate in the 1961 mechanical Exhibit in the Department of Commerce Building at Washington, D. C.

Polychrome Corp. has announced the acquisition of **Cellofilm Industries, Inc.,** which will be operated as a wholly-owned subsidiary. The new company will be known as Cellofilm Corp.

Mr. Goldstein

Mr. Amos

Wica Chemicals, Inc.

Gayle Rogers has been named southern district sales manager in the dyestuffs department of the chemicals and dyestuffs division of **Koppers Company, Inc.**

Otis L. Holland has joined **Meinhard & Company, Inc.,** as the representative in the Carolinas and Virginia, with offices in Greensboro, N. C.

O. Scott Trigg has joined **Virginia Chemicals & Smelting Co.** as district sales representative. Mr. Trigg will cover the south central states and make his headquarters in Memphis, Tenn. J. A. Weatherford has been promoted to the newly created position of director of sales.

Steel Heddle Manufacturing Co. has announced the appointment of Robert W. Westmoreland as sales representative, assigned to the Greensboro, N. C., office. J. D. Carson has been named to work out of the Atlanta, Ga., office.

Charles W. Coker, Jr., has been elected to the board of directors of **Sonoco Products Co.** P. C. Coggeshall, R. B. White, and C. W. Coker, Jr., have been elected vice-presidents. * * * L. H. Stokes has been named to the newly created position of general field sales manager, and C. H. Campbell, Jr., was appointed assistant. Robert Blackwell has been named divisional sales manager. J. A. Gainey has succeeded Mr. Campbell as resident sales manager of the Company's Atlanta plant; R. E. Tuck is his assistant.

A new $200 thousand plant will be constructed in Greer, S. C., by **Southern Machinery Co.** The 30,000 sq ft building will house the administrative and clerical offices, a research and development division, and the manufacturing plant. October 1 has been set for completion date.

John A. Amory has joined the marketing staff of **Leesona Corp.,** as

For further information use Handy Return Card, Page 149

Mr. Westmoreland
Steel Heddle Mfg. Co.

Mr. Carson

Mr. Ruppe
Louis P. Batson Co.

Mr. Bland

a senior market analyst.

J. & T. Boyd, Ltd., Glasgow, Scotland, has appointed **Ralph Gossett and Co.** of Greenville, S. C., exclusive representatives in the United States for the Boyd spinning and twisting frames.

Eric B. Norman has joined **H. W. Butterworth & Sons Co.,** calling on mills on the West Coast, New York, Michigan, Wisconsin, and Canada.

Mr. Richardson
Mortex Chem.

Mr. Penn
Standard Chem.

Three new representatives have been appointed by **Mason-Neilan,** division of Worthington Corp., for the southeastern states. Systems Service Corp., Charlotte, N. C., Ward K. Stallings Co., Atlanta, Ga., and Frank A. Thomas Co., Mobile, Ala. The company has closed the district offices at Atlanta, Ga., and Birmingham, Ala.

Deering Milliken, Inc., has named Kenneth Merrill to the newly-created post of merchandise manager for the yarn sales division. Mr. Merrill will work in sales to all markets and territories in both the knitting and weaving trades.

The new plant of **Talladega Foundry and Machine Co.,** and **Talladega Machinery & Supply Co.,** has been completed.

J. M. Senesac has joined the sales promotion department of the **Cravenette Company, U. S. A.**

Richard C. Richardson has been appointed technical representative for **Moretex Chemical Products, Inc.,** for the North Carolina area.

Horace D. Penn has been appointed sales representative for **Standard Chemical Products, Inc.** Mr. Penn will work in the North Carolina and Virginia area.

Norman W. Paschall Co., Inc., East Point, Ga., preblended cotton merchant and processor of textile waste, is building a 75,000 sq ft cotton and waste processing plant in Peachtree City, Ga., a completely new pre-planned city about 25 miles south of Atlanta. New machinery and expanded facilities in the new $500,000 plant will mean a substantial increase in output, said Norman W. Paschall, owner of the firm.

H. G. Heedy has been appointed product manager for rayon staple fiber for **American Enka Corp.** Paul E. Dochety and Jack C. Webb have been named assistant sales managers for rayon industrial yarns.

An agreement has been reached by **Edward Mendell Co., Inc.,** and **Burkart-Schier Chemical Co.,** for the sale and distribution by the latter company of a complete series of alginate products in Virginia, North and South Carolina, Tennessee, Georgia, Mississippi, and Louisiana.

Dr. Alfred Guenther and Dr. Johannes Wenghoefer have been appointed vice-presidents of **Hoechst Chemical Corp.,** and Geneieve Michaleci has been named assistant secretary.

John De Kalb has joined the staff of the **Woonsocket Color & Chemical Co.** as technician and salesman in the southern territory.

Roger W. Parkinson has been appointed engineering manager for textile applications for **The Fafnir Bearing Co.**

New York & New Jersey Lubricant Co. recently celebrated their 65th year in business.

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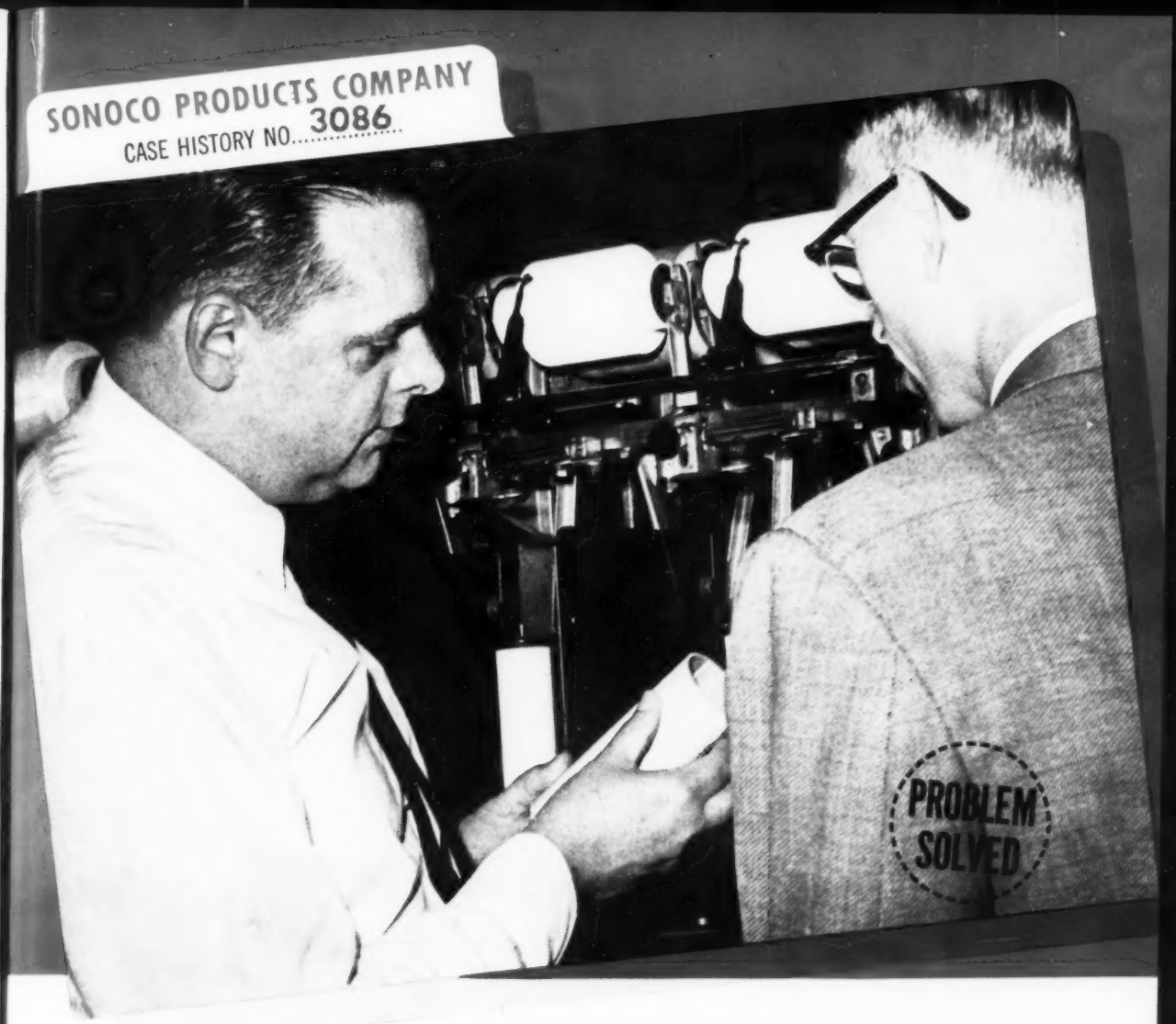

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